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Measuring level of public relations in hospitals

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From the Editor

This is the ninth issue this year with papers form the region looking at a variety of issues.

A paper from Saudi Arabia looked at Family Medicine Essentials (FAME) model as a way to put clinical practice guidelines into practice. The FAME course includes seven modules and each module is carried out in three days. It is designed to give knowledge, change attitudes, and improve skills in a few main areas of family medicine based on either international or national established clinical practice guidelines. The overall impact can be assessed by pre-implementation and post-implementation assessment; however, individuals can be assessed by pre and post-tests at the beginning and end of each module. The FAME course is an effort to put preferably national, but also international, clinical guidelines into practice through a well structured and standardized training program based on evidence-based medicine.

A cross-sectional study in Iraq was conducted on 400 diabetics attending INDC. This study aimed to identify patients who experience continuity with a physician in Iraqi National Diabetes Center (INDC) and to determine its contributory factors, and outcomes. The percentage of patients who had a personal doctor in INDC was 70.2%. The findings of this study support the findings of previous studies in highlighting the importance and role of interpersonal continuity in diabetes care. Policy makers need to develop and activate programs to improve continuity of care between diabetics and their doctors.

A paper from Saudi Arabia explored Diagnosis and Management of Short Stature. The authors stressed that short Stature can have intense implications on the psychosocial health of children and adolescents. The consequences can be far reaching, affecting even adulthood. The review provides an explanation of the definitions and the terminologies associated with short stature. An evidence based approach is outlined and the common treatment options are discussed.

A paper from Jordan undertook a prospective study to highlight the essential role of hysteroscopy in the evaluation and treatment of women presenting with recurrent implantation failure after in-vitro fertilization, recurrent pregnancy loss, unexplained infertility and abnormal uterine bleeding. They found that hysteroscopy should be considered as early as possible in the diagnostic work-up of these patients.

A paper from Iran looked at recent advances in geographical sciences and technologies i.e. Geographical Information Systems (GIS) and the further development of the Global Positioning System (GPS), that offers family doctors, public health officers and non-government organizations (NGOs) valuable tools with which to study the 'place' component of public health problems, as well as areas in need of doctors and medical facilities.

A descriptive-analytical study was performed cross sectionally from Iran to determine level of public relations in hospitals. A questionnaire was used for data collection. Samples consisted of patients hospitalized in Zarand hospitals; all were selected using simple random sampling. Data was analyzed using one sample t test through SPSS. The studied hospitals performance regarding public relations was higher than average. The authors concluded that average aspect of public relations was medium. According to findings of this study, several factors decreased the level of public relations and the image of hospital; recognizing these factors can increase public relations in hospitals.

A cross-sectional survey was carried out at well baby clinic and employee health clinic in King Abdul Aziz Medical City and well baby clinic at Health Care Specialties Clinic (HCSC). Nearly 200 questionnaires were filled out by the mothers and by face to face interview. The aim was to explore the pattern of breastfeeding in working and non-working mothers and the factors specifically related to work and breastfeeding. The authors concluded that breastfeeding is poor in both working and non-working mothers. Work has anegative impact on breastfeeding pattern, however, lesser working hours, breastfeeding breaks and support from employers may help in restoring some breastfeeding patterns.

A paper from Yemen explored the clinical and paraclinical characteristics of acute intravascular hemolysis caused by primaquine so as to help in prevention, early diagnosis and treatment. Analysis of 57 cases of acute intravascular hemolysis caused by primaquine was made and a literature review was done. All patients had the history of administering primaquine, with the symptoms of acute hemolysis; the clinical and paraclinical characteristics of acute intravascular hemolysis were observed: sudden attacks of lumber and abdominal pain, vomiting, fever, oligo-anuria, temporary consciousness loss, dark urine (black), low hemoglobin, high reticular red blood cell, and jaundice. The authors concluded that when sudden attacks of the above symptoms appear, the acute intravascular hemolysis should be taken into consideration first and the giving of the primaquine orally be immediately stopped. Active and proper treatment should be made. Whilst primaquine remains the drug of choice to eradicate hypnozoites and control P. vivax transmission, the risks associated with its use must be minimized during its deployment. In areas where P. vivax exists, patients should be tested for G6PD deficiency and adequately informed before administration of primaquine.

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Hysteroscopy: The Gold Standard Diagnostic and Therapeutic Tool in Gynecology. Our experience at Queen Alia Hospital, Jordan

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Abstract

Objective: The purpose of our study is to highlight the essential role of hysteroscopy in the evaluation and treatment of women presenting with recurrent implantation failure after in-vitro fertilization, recurrent pregnancy loss, unexplained infertility and abnormal uterine bleeding.

Methods: This prospective study was carried out in the Gynecology Department at Queen Alia Hospital, Jordan. Patients who underwent diagnostic or therapeutic hysteroscopy between May 2011 and April 2012 were included in the study. Hysteroscopic findings and the procedures performed were collected and analyzed using SPSS. Numbers and percentages were calculated and analyzed to describe the results.

Results: Of the 379 patients studied, 171 women (45.1%) had intrauterine pathologic findings. In patients with history of recurrent implantation failure after in-vitro fertilization, 17 (54.8%) out of 31 patients had abnormal hysteroscopic findings. Out of 49 patients with a history of recurrent pregnancy loss, 22 patients (44.9%) had intra uterine abnormalities. Of 54 patients with unexplained infertility, 24 patients (44.4%) had uterine cavity pathology and out of 245 patients with abnormal uterine bleeding, 137 patients (55.9%) had normal and 108 patients (44.1%) had abnormal hysteroscopic findings. One hundred and twenty two operative hysteroscopic procedures were performed. The most common procedure was hysteroscopic endometrial polypectomy (38.5%).

Conclusion: Because of the high rate of intrauterine pathology in women with recurrent implantation failure after in-vitro fertilization, recurrent pregnancy loss, unexplained infertility and abnormal uterine bleeding, hysteroscopy should be considered as early as possible in the diagnostic work-up of these patients.

Key words: Hysteroscopy, Abnormal uterine bleeding, Infertility, Recurrent implantation failure.

Introduction

Repeated Failure to achieve a successful pregnancy after in-vitro fertilization (IVF) may be explained by many factors. These factors can be classified into three categories: Abnormal endometrial receptivity (uterine cavity defects), embryonic abnormality and a multifactorial effect. One of the most important factors of recurrent implantation failure after IVF (RIF after IVF) is undiagnosed uterine pathology. In 18-27% of women with a normal initial hysteroscopy, repeated hysteroscopic evaluation after RIF discovered intrauterine pathology, mainly endometrial hyperplasia, fibroids, endometritis, polyps and intrauterine adhesions (1). In the presence of good-quality embryo transfer and RIF after IVF, uterine cavity is the first factor that should be re-evaluated.

Several recent studies (2,3,4) have demonstrated that hysteroscopy is important and beneficial for women developing implantation failures after IVF. There is also significant evidence that subsequent pregnancy rate is improved even in RIF with normal hysteroscopic findings, and that just the procedure itself has a positive prognostic role for improving subsequent pregnancy rate (4). Pansky et al in their study have shown that hysteroscopy discovered an abnormal uterine cavity in 30% of women evaluated for either primary or secondary unexplained infertility and they concluded that routine diagnostic hysteroscopy should be part of an infertility work-up (5).

The other aspect in which hysteroscopy can give important information is in the evaluation of patients presenting with recurrent pregnancy loss (RPL). Recurrent miscarriages are defined as the occurrence of three or more consecutive pregnancy losses and it is the cause of significant psychological and social stress for patients, their families and doctors. In the study by Helio et al (6), uterine cavity abnormalities were found in 38.3% of patients with RPL.

Abnormal uterine bleeding (AUB) is a common problem in women attending the gynecologic clinic. It can result in significant disturbances of normal and healthy lifestyle.

Anatomic and structural defects of the myometrium, endometrium, or endocervix are frequent causes of AUB (7). The diagnostic evaluation of this problem should be directed toward detecting these lesions. However, because submucosal or intramural fibroid, endometrial and cervical polyps may be missed even by the most experienced examiners, further evaluation should be started even if the initial pelvic examination is normal. Hysteroscopy is both accurate and feasible in the diagnosis of these pathologies (8).

Formerly, the cervical dilatation and endometrial curettage (D&C) was the procedure of choice for assessment of patients presenting with AUB. This procedure obtains endometrial tissue for histopathological assessment. Blind exploration of the uterine cavity, however, can miss small but clinically important pathologic lesions. Hysteroscopy guarantees a high diagnostic accuracy, permitting the simultaneous accomplishment of directed biopsies and surgical treatment of the visualized lesions (9,10). In patients with AUB, hysteroscopy provides more accurate diagnosis of endometrial pathology than the traditional D&C (11).

At the present time, there is a debate related to the role of routine hysteroscopy in sub-fertile women prior to IVF and still there is no conclusive evidence of its benefit. The purpose of our study is to highlight the essential role of hysteroscopy in the evaluation and treatment of women presenting with recurrent implantation failure after in-vitro fertilization, recurrent pregnancy loss, unexplained infertility and abnormal uterine bleeding.

Methods

This prospective study was of all diagnostic and therapeutic hysteroscopic cases which were performed between May 2011 and April 2012 in gynecology department at Queen Alia Hospital (QAH)-Jordan. Three hundred and seventy nine patients were included in our study. A written informed consent regarding the procedure itself and its potential risks and possible side effects was obtained from all patients. The inclusion criteria for the study were women presenting with history of RIF after IVF, unexplained infertility, recurrent pregnancy loss (three or more consecutive spontaneous miscarriages) and women with AUB.

Recurrent spontaneous miscarriages were defined as two or more implantation failures. AUB was defined as bleeding that is excessive in amount, duration, or both at regular or irregular intervals, intermenstrual and postmenopausal bleeding. Patients with abnormal or suspicious sonographic lesions (uterine fibroids, cervical or uterine polyps, uterine septum and intrauterine adhesions) also were included in the study. Each patient underwent complete physical and clinical assessment. Women with severe cardiac or respiratory diseases, active genital tract infections, pelvic inflammatory disease, active bleeding, cervical cancer, and suspected pregnancy were excluded from the study. All hysteroscopic procedures were performed in the operating theatre under general anesthesia in lithotomy position and usually as an outpatient procedure, unless there was a medical or surgical indication for admission. In premenopausal women, hysteroscopy was arranged in the proliferative phase of the menstrual cycle. In all cases we used a rigid hysteroscope with 5 mm diameter and 30 degrees view (Karl Storz GmbH, Tutlingen, Germany) which is the most preferable for routine use because it permits endoscopic examination without cervical dilatation. Vaginoscopic, no-touch technique was used to insert the hysteroscope under visual control. The intrauterine pressure was maintained between 60-100 millimeter of mercury. Instruments used in surgical hysteroscopic procedures were scissors, grasping forceps and the resectoscope from Karl Storz, Germany. Intrauterine

Hysteroscopy Findings	RIF n(%)	RPL n(%)	Infertility n(%)	AUB		Total
				Pre-meno pause n(%)	Post-meno pause n(%)	
Normal	14(45.2%)	27(55.1%)	30(55.6%)	89(56.7%)	48(54.5%)	208(54.9%)
Abnormal	17(54.8%)	22(44.9%)	24(44.4%)	68(43.3%)	40(45.5%)	171(45.1%)
Myoma	5(29.4%)	6(27.3%)	4(9%)	18(28.6)	3(3.8%)	45(26.3%)
Polyps	6(35.3%)	5(22.7%)	5(20.8%)	19(27.9%)	5(12.5%)	47(27.5%)
Adhesions	2(11.8%)	3(13.6%)	2(8.3%)	2(2.9%)	-	10(5.8%)
Septat	1(5.9%)	3(13.6%)	3(12.5%)	-	-	7(4.1%)
Subseptat	1(5.9%)	3(13.6%)	4(16.6%)	1(1.5%)	-	9(5.3%)
Hyperplasia	1(5.9%)	1(4.5%)	2(4.2%)	16(23.5%)	8(20%)	28(16.4%)
Atrophy	1(5.9%)	-	1(4.2%)	4(2.9%)	19(47.5%)	25(14.6%)
Total	31	49	54	157(64%)	88(35.9%)	379

Table 1: The rates of normal and abnormal hysteroscopy findings according to indications

pathologic lesions, such as polyps, pedunculated or submucosal fibroids, septae and intrauterine adhesions were planned to be treated at the time of diagnosis with hysteroscopic scissors and resectoscope. Any tissues obtained by directed biopsy or endometrial curettage were followed by histopathologic examination.

Results

In the present study, of 379 patients studied, 171 women (45.1%) had intrauterine pathologic findings. In patients with history of RIF after IVF, 17 (54.8%) out of 31 patients had abnormal hysteroscopy findings. Of 54 patients with unexplained infertility, 24 patients (44.4%) had uterine cavity pathology. Out of 49 patients with history of RPL, 22 patients (44.9%) had intra uterine abnormalities and out of 245 patients with AUB, 137 patients (55.9%) had normal and 108 patients (44.1%) had abnormal hysteroscopy findings. The rate of different hysteroscopy findings according to indications and the distribution of abnormal hysteroscopy findings in patients presenting with AUB in pre- and post-menopausal women are shown in Table 1 (above).

The most common abnormal hysteroscopy findings in patients presenting with RIF, RPL and in infertile women were polyps (35.3%), Mullerian structural abnormalities (27.2%) and uterine myomas (33.3%), respectively as shown in Table . In the present study, 245 patients (64.6%) were evaluated for AUB. These patients were categorized into premenopausal 157 (64.1%) and postmenopausal 88 (35.9%) women. The incidence of uterine cavity pathology was (43.3%) in premenopausal and (45.5%) in postmenopausal women. The most common findings were polyps (38.2%) and fibroids (27.9%) in premenopausal women, endometrial atrophy (47.5%) and endometrial hyperplasia (14%) in postmenopausal women.

Out of 122 operative hysteroscopy procedures performed in the study period, 47 (38.5%) were for resection of endometrial polyps and 45 (36.9%) for resection of submucosal myomas. The other surgical procedures were intrauterine adhesiolysis (8.5%), endometrial resection (6.6%) and septum resection (9.8%) Table 2 (top next page).

Discussion

Intrauterine lesions such as submucous fibroids, endometrial polyps, adhesions and structural abnormalities of the Mullerian ducts are common and may impair fertility leading to poor reproductive outcome, including RIF after IVF despite good-quality embryo transfer and recurrent spontaneous miscarriages (6,12,13).

Only a few years ago, assessment of the uterine cavity in patients presenting with unexplained infertility and in AUB in our hospital was carried out using traditional methods; hysterosalpinography and D&C. Recently, with advancement in sonography and introduction of

Hysteroscopy procedure	Number	Percent
Polyp resection.	47	38.5
Myoma resection.	45	36.9
Septum resection.	12	9.8
Endometrial resection.	8	6.6
Adhesiolysis.	10	8.2
Total	122	100

Table 2: Operative hysteroscopy procedures described as numbers and percentages

hysteroscopic technologies, the diagnostic approach has changed. Hysteroscopy allows not only direct visualization, but also treatment of the cervical and uterine cavity pathologies. It has been strongly suggested that all patients with RIF after IVF should undergo evaluation of the uterine cavity before starting any other fertilization procedures (14,15,16). The high rate of intrauterine pathology (54.8%) in our patients presenting with infertility and RIF after IVF is consistent with results of other earlier studies (17,18,19). Endometrial pathology may interfere with implantation by increasing uterine contractility, vascular changes, enhancement of endometrial inflammatory reaction and increase production of growth factors resulting in impairment of endometrial receptivity, or in mechanical defects leading to unsuccessful implantation (20,21). Uterine septum is associated with increase in abortion rates due to abnormal endometrial vascularity or changes in the endometrial structure, resulting in abnormal endometrial tissue which may be unsuitable for implantation and/or growth and development of the embryos with subsequent implantation failures or spontaneous miscarriages.

Currently, the European Society of Human Reproduction (ESHRE) guidelines indicate that diagnostic hysteroscopy is unnecessary as a routine method of investigation in infertile patients, unless there is a sonographic or hysterosalpingographic suspicious findings (22). Nevertheless, it was found by Shokeir et al (23) that 26% of patients with normal HSG findings have abnormal hysteroscopic findings. In the present study, the most common abnormal hysteroscopic findings in patients presenting with infertility an RIF were polyps (35.3%), followed by uterine myomas (29.4%). The other abnormal findings were intrauterine adhesions, structural Mullerian abnormalities, endometrial hyperplasia and endometrial atrophy. Our results are in agreement with the study by Larusso et al (24), who showed that abnormal hysteroscopic pathologies were present in (40.6%) of patients with infertility and RIF after IVF. The most common findings were endometrial and cervical polyps. They concluded that diagnostic and therapeutic hysteroscopy have a significant role in the evaluation and treatment of these patients and they suggested introducing hysteroscopy as a routine part of investigation work-up. In 2009, Makrakis et al (2) and Rama et al (15) found that correction of abnormal hysteroscopic pathologies resulted in significant improvement in pregnancy rates in subsequent IVF cycles.

Our study has stressed the role of hysteroscopy in evaluation and treatment of patients presenting with AUB. Of the abnormal hysteroscopy findings in these patients, the most common were polyps (38.2%) and uterine fibroids (27.9%) in premenopausal women, endometrial atrophy (47.5%) and hyperplasia (14%) in postmenopausal women.

Until recent times, in our hospital, traditional blind D&C was used to evaluate patients presenting with AUB. In fact, this method detects the uterine cavity pathologies in less than 40% of the cases. Since the introduction of hysteroscopy in our hospital, this technique has almost replaced the blind curettage. Hysteroscopy is a minimally invasive and simple method by which the cervix and uterine cavity can be examined under direct vision. It provides immediate diagnosis, directed biopsy of the suspected area and prompt treatment. At present, office hysteroscopy can be performed as an outpatient procedure without any anesthesia or analgesia. Unfortunately, we don't have the suitable instruments to perform this procedure in the gynecologic office. In our study, all diagnostic and operative hysteroscopic procedures were performed in the operating theatre under general anesthesia. During the study period, 122 operative hysteroscopic procedures were performed. The commonest was endometrial polyp resection (38.5%), and myoma resection (36.9%). Other procedures were septum resection, endometrial resection/ablation and adhesiolysis.

Hysteroscopic adhesiolysis for intrauterine adhesions constituted (8.2%) of all surgical procedures performed. Before the introduction

of hysteroscopy, treatment was by an attempt to introduce a sound or curette blindly into the uterine cavity to disrupt the adhesions. At present, the use of hysteroscopy for diagnosis and treatment of uterine synechiae has been shown to be accurate, safe and effective. It is the preferred method for the treatment of uterine septum, endometrial polyps and uterine myomas. Resection of such lesions may enhance fertility, improve subsequent pregnancy rate and reproductive performance (2,23,24).

Hysteroscopy is the gold standard method for evaluation of the cervix and uterine cavity. It allows direct visualization of uterine cavity, identifies the nature, size and location of any intrauterine abnormalities, such as, myomas, polyps, Mullerian structural defects and intrauterine adhesions. It also permits directed biopsies and correction of uterine cavity pathologies.

Conclusion

Because of the high rate of intrauterine pathology in women with recurrent implantation failure after in-vitro fertilization, recurrent pregnancy loss, unexplained infertility and abnormal uterine bleeding, hysteroscopy should be considered early in the diagnostic work-up of these patients.

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Measuring level of public relations in hospitals

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Abstract

Introduction: **Public relations is a part of a managers' duties in every organization and is a continuous and programmed action through which people and organizations try to obtain the agreement and support of those they work with. Recognizing level of public relations is of great importance because it plays an important role in improving efficiency of organizations and even organizational consequences.**

Objective: **The aim of this research was to determine level of public relations in hospitals.**
Method: **Present descriptive-analytical study was performed cross sectional. A questionnaire was used for data collection. Samples consisted of patients hospitalized in Zarand hospitals; all were selected using simple random sampling. Data was analyzed using one sample t test through SPSS.**

Results: **The studied hospitals performance regarding public relations was higher than average. Most subjects were more than 40 years old and were married (65.5%); some were contractual employees (41.5%). Mean and standard deviation of hospitalization period was 3.46+-2.25 days.**

Conclusions: **The average aspect of public relations was medium. According to findings of this study, several factors decreased the level of public relations and the image of hospital; recognizing these factors can increase public relations in hospitals.**

Keywords: **public relations, hospital, relations.**

Introduction

Interaction with clients inside and outside the organization is necessary for keeping dynamics and survival of that organization as well as obtaining the objectives of organizations. Mutual understanding of clients plays an important role in improving processes, removing shortcomings and strengthening weak points of every organization.[1] In today's communication and information era where societies are moving towards evolution and civilization, public relations has appeared to be known as the main element and component of communication and as an important factor in establishing subjective and objective partnerships due to the communicative and interactive nature of organizations and organizational duties and activities.[2] Public relations is a mutual and informed attempt which organizations and the relevant social groups make to meet society's acceptable objectives through communication and reaching a common understanding among communication parties.[3] Public relations has been perceived as a marketing supportive technique and industry.[4] One of the best descriptions for public relations is that "Public relations is managing communications among social

groups and organizations".[5] In fact, public relations is in charge of establishing communications with the heart of an organization and its main shareholders; thus, it is a guiding performance which, in its highest point, relates to the management and applies tactical tools to execute the described guidelines. Some people believe that public relations helps an organization and its clients adapt each other mutually.[6] Organizations can survive without public relations but those organizations that use public relations effectively can find it easier to sell their products, employ new employees, keep their employees and deal with providers. Good and correct public relations causes a product to be perceived positively which in turn encourages the market to obtain that product, causes customers to value it more (support its price) and encourage them to introduce it to their friends.[7]

Dimensions of public relations are as follows:

Mutual control: level of agreement on who has the real power to affect others. However, a little imbalance is normal. In order for organizations and people to have some control over each other, stable relations are necessary.

Merit: believing the fact that an organization is able to do what it has said.

Satisfaction: a level of desirable situation which a person feels in every section.

Liability: the amount of energy each person should spend to establish his communications in order to improve and survive.

Mutual relations: in mutual relations, a person benefits others only due to the fact that they have done it before or they are going to do it in future.

Trust: believing the fact that an organization is relatively good.

Dependency: believing the fact that an organization will do whatever it says.

Relation: in mutual relations, both parties benefit each other because they are concerned with welfare and comfort of each other (even when they receive nothing in return for their work).[8]

One of the duties of public relations is to continuously improve recognition and importance of hospitals in the society and to observe them. A lot of factors decrease public relations and image of hospital and thus cause people to complain. The following are the ways of perceiving level of public relations in hospitals: study the patients' satisfaction level, determining the opinion of most clients, determining the number of received complaints, determining scope of society voluntary attempts, determining level of medical employees' substitution, determining adaptation level of care providers to patients, determining the amount of hospital received gifts, determining patients' refusal of physicians' prescriptions.[9] Establishing communications and transferring messages constitute the central core and main part of public relations activities. Public relations authorities should definitely recognize communicative canals and tools available in the society and should be completely aware of their performances.[10]

In a study carried out by Childers Hon Linda et al entitled "Guidelines to measure public relations in General Steel, Red Crescent, Microsoft, Social Security and National Rifle Association" showed that the mutual relations was high in all the studied companies (more than 5.4); level of trust, mutual control, liability and satisfaction were medium (3-5.4).[8] In another study carried out by Sterne et al entitled " study the public relations in managers' duties" it was shown that 57% of respondents announced that "public relations provides marketing with some information; public relations is followed by good results which support production and which improve company goods; and good public relations is clear communication which embraces trust and acceptable structures beyond time."[11]

Concerning the role of public relations in improving efficiency and productivity of hospitals, this study was carried out to determine the level of public relations in hospitals.

Work Method

This research is of descriptive-analytical type which was carried out in all hospitals of Zarand Town; statistical universe of this research was all patients hospitalized in the above hospitals. To do this research, a two-section questionnaire was used (demographic specifications and aspects of public relations). To determine its content validity, the questionnaire was given to some university teachers. To determine reliability, tools were given to 15 subjects within two weeks in a preliminary study. Making use of test-retest to determine reliability, Cronbach's alpha coefficient showed 0.87 for reliability. To select samples, simple random sampling was used. Data was analyzed using software SPSS. To show data frequency, descriptive statistics were used; single-sample T test was used to measure the level of public relations in hospitals.

Results

Results of this research showed that most studied subjects were females (57.15). Average age of subjects was 34.02; 65.5% were married and 41.5% were contractual employees. Mean and standard deviation of hospitalization was 3.46 +-2.25 days (Table 1 - opposite page). 27% of subjects mentioned that the hospital kept all its promises and had the ability to perform all its promises. Most of them (25%) said that the hospital worried about the patients' welfare, asked the patients to participate in decision making processes and helped those who had low income. Most patients (24%) were satisfied with employees and manager's fair behavior. 30% of patients announced that the hospital guided them well. In this study, low-income patients were more satisfied with the hospital ($p<0.05$). There was a significant relationship between satisfaction level and personnel's behavior ($p<0.05$). 23% of patients were satisfied with personnel's

No.	Gender	Education	Age	Employment type	Marital status
200 patients	85 females 115 males	18: illiterate 68: elementary school education 114: university education	20-40 years	42: Self employed 83: Governmental employee 74: Unemployed	69: Single 131: married

Table 1: Patients' social-demographic characteristics

No.	Item	Mean	Judgment
1	Merit level	M>5.4	P value≥0.05
2	Relations level	5.4>m<3	P value≥0.05
3	Mutual relations level	5.4>m<3	P value≥0.05
4	Mutual control level	m>5.4	P value≥0.05
5	Liability level	m>5.4	P value≥0.05
6	Satisfaction level	m>5.4	P value≥0.05
7	Trust level	m>5.4	P value≥0.05
8	Dependency level	5.4>m<3	P value≥0.05

Table 2: Distribution of studied units in terms of options of public relations questionnaire

behavior. 22% mentioned that hospital wanted to maintain its relationship with patients. The relationship between satisfaction level and education and marital status of patients was not significant statistically (P>0.05). 23% of patients said that hospital had a tendency to order patients. No significant relationship was found between mutual interaction and patients' hospitalization duration (P>0.05). There was a significant relationship between hospital dependency level and patients' satisfaction level (p<0.05). The relationship between hospital merit level and patients' satisfaction was significant statistically (p<0.05). Average merit level in Imam Ali and Sina Hospitals was 6.06 and 5.63 respectively. Average mutual control in Imam Ali and Sina Hospitals was 5.57 and 5.36 respectively. Average liability in Imam Ali and Sina Hospitals was 5.79 and 5.67 respectively. Average satisfaction level in Imam Ali and Sina Hospitals was 5.58 and 5.43 respectively. Average mutual interaction in Imam Ali and Sina Hospitals was 5.38 and 5.61 respectively. Average trust level in Imam Ali and Sina Hospitals was 5.78 and 5.69 respectively. Average dependency level in Imam Ali and Sina Hospitals was 5.13 and 5.21 respectively. Average relationship level in Imam Ali and Sina Hospitals was 5.08 and 5.18 respectively. Results of this study showed that merit, relationship, dependency, trust, mutual control, liability, satisfaction and mutual interaction levels were mainly more than 5.4 in both hospitals; they also revealed that no significant relationship was found between these two hospitals (P>0.05) (Table 2).

Discussion and Conclusions

According to our findings, average studied units were medium regarding merit, satisfaction, trust, relationship, dependence, liability, mutual relationship and mutual control levels. Average dimension of public relations was also medium in a study carried out by Childers Hon Linda et al. It was also shown that studied units were desirable regarding average mutual control and average mutual relationship. In a study by Childers Hon Linda et al, it was shown that average mutual control and mutual relationship were desirable.[8] It can be said that this similar situation is due to relatively similar common objectives, common organizational structure and social status. Results related to average liability level revealed that liability was desirable, while it was undesirable in a study by Nahrir et al; the reason may be due to the lack of suitable and effective manpower in that hospital. Regarding satisfaction level, it can be mentioned that average satisfaction was desirable. In a study by Nahrir et al, people were satisfied too because patients in both hospitals were satisfied with different parts of the hospital.[12] Results of average trust showed that trust was satisfactory because both hospitals were honest with the patients and the subjects believed that performance and personnel of hospitals were relatively good. In a study by Childers Hon Linda et al, it was also observed that trust was satisfactory.[8] Thus, it can be said that this similar status is due to the fact that both hospitals are service hospitals and that all clients of these two hospitals are ordinary people. Results related to average relationship revealed that it was

average; thus, in patients' viewpoints, a complete and satisfactory interaction hasn't been established between patients and personnel of these hospitals. In a study carried out by Childers Hon Linda et al, this variable was satisfactory due to good and suitable interaction between clients and personnel. Concerning dependency, studied units showed an average dependency and patients of both hospitals believed that these two hospitals didn't completely perform what they had said. Results of merit level revealed that merit was okay in these hospitals. In a study by Ghalje et al, level of nurses' merit was satisfactory or more than what it is expected to be;[13] this may be due to similarity in similar organizational objectives. In a study by Mosadegh Rad et al, patients' knowledge of their rights was weak and satisfaction was average.[14] Generally speaking, a significant relationship was observed between patients' knowledge of their rights and their satisfaction. Since patients' knowledge plays an important role in their satisfaction level, informing them of their rights and observing these rights by personnel will improve efficiency of hospital services.

According to our findings, managers must recognize and strengthen effective factors in improving public relations; thus, a good management in public relations can decrease and even remove problems of the organization and can reduce environmental pressures imposed on the organization. It can also modify organizational behavior, increase organizational integration and minimize management decision-making burden. Generally, if organization management supports public relations and if public relations management is qualified enough, it can increase organizational success. Patients' mental and physical status while answering the questions was one of the limitations of this research which can affect the general results.

Some suggestions to improve public relations in hospitals:

- making use of the internet by employees and managers and using articles to apply new techniques of public relations
- installing patients' law charter in various parts of hospital and training patients
- employing patient personnel in reception, discharge and emergency sections where patients and personnel most visit
- activating criticism and suggestion box
- focusing on group training rather than individual training
- encouraging employees to participate in group activities
- starting up the patients' relations management unit in hospitals or activating the existing units
- improving employees' information, knowledge and communicative skills
- improving audio-lingual and perceptive skills to establish better communications
- practicing audio-lingual and perceptive skills to establish better communications

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Family Medicine Essentials (FAME): An effort to put clinical practice guidelines into practise in Saudi Arabia

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Abstract

Though there are many continuing medical education activities presently taking place in Saudi Arabia, a centrally organized training course, prepared and presented by certified family physicians, should be developed. The training should cover essential knowledge, attitudes, and skills that are vital for general physicians to improve health outcomes in their practices according to evidence-based medicine. This paper presents the planning phase of a course for general physicians in Saudi Arabia named FAME (Family Medicine Essentials), which is an effort to have a structured and standardized evidence-based course.

The FAME course includes seven modules and each module is carried out in three days. It is designed to give knowledge, change attitudes, and improve skills in a few main areas of family medicine based on either international or national established clinical practice guidelines. As a distinct approach, this course is highly learner-oriented and each specified area starts with a lecture and continues with group work, case discussions, role-playing, and other interactive learning activities.

The overall impact can be assessed by pre-implementation and post-implementation assessment; however, individuals can be assessed by pre and post-tests at the beginning and end of each module. The FAME course is an effort to put preferably national, but also international, clinical guidelines into practice through a well structured and standardized training program based on evidence-based medicine.

Keywords: **Postgraduate Training; Family physicians; Clinical guidelines; Evidence-based medicine; General practitioners; Saudi Arabia**

Introduction

Primary Care (PC) centers have a central role in the Saudi health strategy. Rural as well as urban areas are equipped with PC health centers with patient loads of around 21.5 physicians per 10,000 patients. In total, 2037 primary health care units (Table 1) are currently operating in the Kingdom of Saudi Arabia (KSA) and on an average 2-5 doctors are posted in each centre [1]. There is a shortage of general practitioners (GPs) leading to a search for ways to address the need. Compared with international standards, the average consultation time is low (around 5 minutes) (1). In addition, only a small proportion of medical students are choosing family medicine as a specialty [3], which indicates that the current drastic shortage of trained Saudi primary health care physicians will continue, leading to the further influx of foreign doctors with different educational backgrounds and standards.

On the other hand, there is a great influx of immigrants to Saudi Arabia. Nearly 100,000 foreign citizens enter the country each year [4]. Of course, this movement is increasing the diversity of the population, including that of the doctors working in primary care settings. For example, out of a total of 2704 physicians in the Riyadh region, only 21.8% were Saudi in 1998. (The nationwide ratio of non-Saudi to Saudi doctors was 5.25.) [5].

There are significant differences among the practices of PC doctors [6]. Although one study demonstrated that around 90% of primary care physicians are willing to perform periodical health screenings [6], the real figures are disappointing: according to another study [7], only one third of doctors know the correct definition of hypertension, 42% know the prevalence of hypertension, and only 57% know the major complications of hypertension. Only 56% of doctors

Regions/Areas	Number of units
Riyadh	377
Al-Kharaj	76
Taif	105
Jeddah	110
Medinah	134
Eastern	126
Al-Hassa	68
Hafaral Batin	34
Aseer	227
Bisha	72
Hail	93
Qaseem	152
Tabuk	67
Najran	62
Jizan	149
Northern Borders	41
Al-Baha	91
Al-Jouf	33
Quraiyat	20
Total	2,037

Health Resources. Kingdom of Saudi Arabia Ministry of Health 2008 available from: URL: http://www.moh.gov.sa/statistics/s2008/2008.html [1].

Table 1: Primary health care units in Saudi Arabia

would actually screen patients above 35 years of age for hypertension. Even the referral system has problems, both from the hospital specialist as well as the GP's perspective. The majority of referral letters from the GP lack commonly accepted standards of information about the patient, while only 23% receive feedback from the hospital specialist [8]. PC physicians' deficiencies include the theoretical basis of the discipline as well as clinical knowledge [9], skills, and recording and reporting of diseases [10].

Evidence-based medicine (EBM) is a style of practice in which doctors manage problems by reference to valid and relevant information. Unfortunately, research consistently has shown that clinical decisions rarely are based on the best available evidence. Since primary care is the essential foundation of effective health care systems, it follows that providing evidence-based primary care would reflect positively on the community's health. [11]

Nevertheless, caution about the potential for misuse of EBM has been voiced by GPs based on the biopsychosocial model of general practice and concerns about the limited utility of largely biomedical evidence to general practice [12].

Thus there is an urgent need to develop a standardized course for GPs that fulfills all the requirements of GPs' role [13] as well as guide them in how to apply standardized care through recommended international and national guidelines. The FAME course is an effort to fulfill all these requirements and started in 2008 and so far four rounds have been completed in 2011.

Aims of the Course

By the end of the course, participants are expected to improve their knowledge, skills, and attitudes regarding the definition and basic principles of family medicine, the approaches of primary care physicians in managing diseases, and basic methods of communicating with the patient. Attention is given to the most important clinical problems and situations that general practitioners face in their daily life. Concrete information accumulation, which will be usable right after the course during daily clinical practice, is aimed in the management principles of most common problems.

Methods of Implementation

Teaching approach

The course is mainly constructed to enable interactive learning with opportunities for peer learning, self-directed learning, and brainstorming, small and large group discussions, and didactic lecturing with audiovisual support, as well as problem based approaches. Group discussions, role-plays, and case discussions will be used to facilitate behavioral changes.

Participants

This course is developed for GPs. All GPs working in the KSA are eligible to attend this course depending on their workload.

Trainers

The course trainers will be qualified staff from the postgraduate training centers. The management according to need may add additional trainers from the field. All trainers are experienced and board certified family physicians assigned by the Ministry of Health who have received a certificate of attending an orientation course on the FAME program (conducted by the Center of Postgraduate Studies in Family Medicine, Riyadh). In addition, they also need to attend a Training of Trainers workshop for refreshing of their trainings and to maintain the standards of the course.

Structure of the Course

This course consists of presentations, group work, role-plays, and case studies performed over 21 teaching days organized into seven modules (Figure 1 - opposite page).

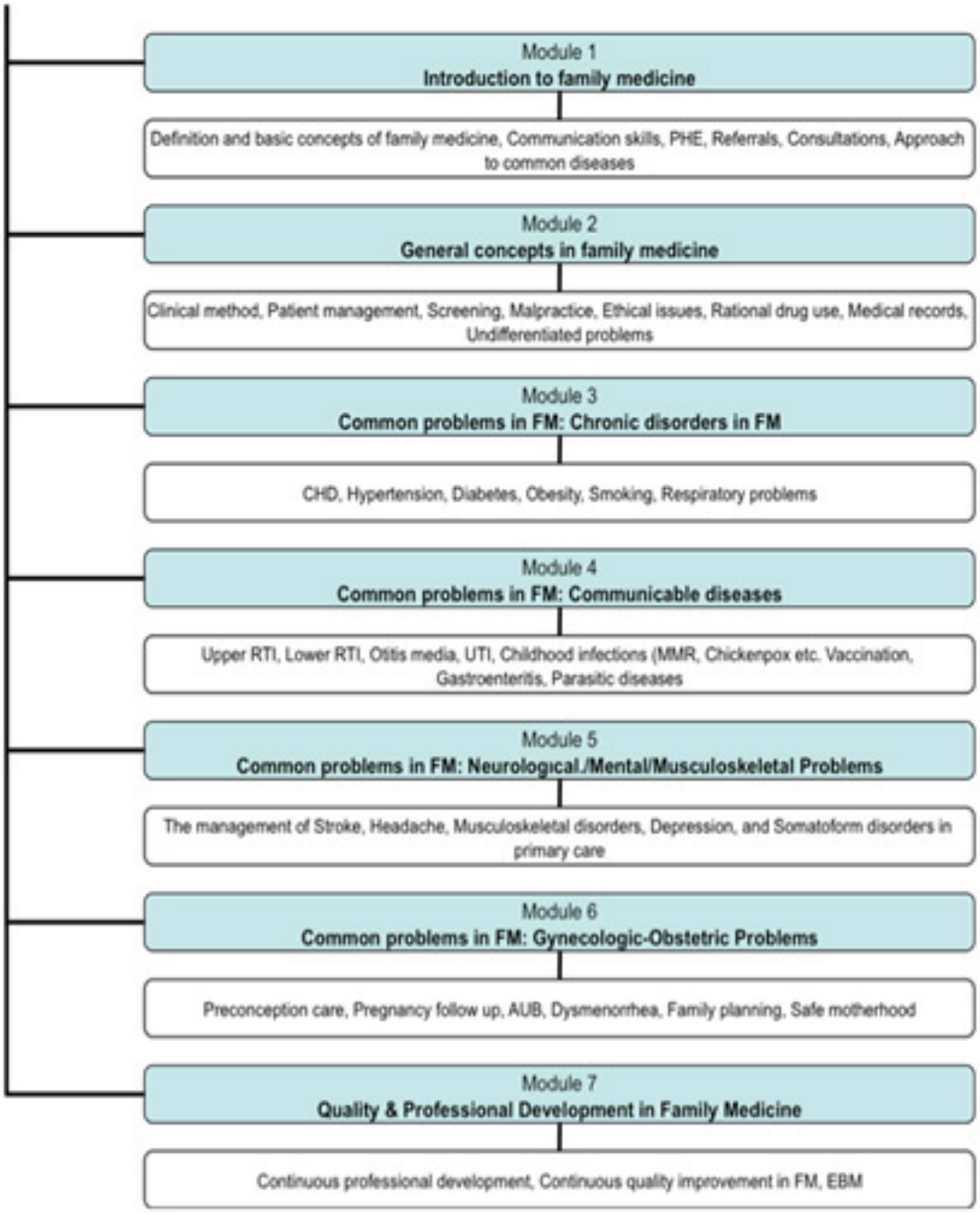

Figure 1: Topics of seven Modules

There is 18 hours total teaching activity with additional study expected to be done during the lunch breaks and at home for each module. The course is designed to present theoretical information on some main areas of family medicine including the definition and scope of family medicine, communication skills, consultation and referral, and the clinical method in family medicine. Each specified area starts with a lecture and continues with group work, discussions, and other interactive learning activities. The course is designed to take the learners beyond theoretical knowledge to concrete and practical information, which they can directly apply at work based on the national and international practice guidelines (Table 2 - next page). The main structure of the course is learning in small groups supported by short didactic lectures. The approximate division of the total learning time is as follows: 60% interactive sessions, 30% didactic lecturing, and 10% self-directed learning.

Learning environment

A good learning environment will be established for the trainees from physical, organizational, as well as communicative, perspectives. Air conditioning of the rooms will be available with suitable ventilation and lighting. A comfortable U-shaped seating plan is suggested, but it is flexible according to the learners' needs and resources. Water and other drinks will be provided during the breaks. A warm atmosphere will be established between the trainers and trainees where everybody can express themselves, without any concern about the content of their ideas or the correctness of their thoughts. Gender, religious, and national identities, as well as other human variations will be welcomed without discrimination. The course will not be used at any way for purposes that might cause any conflicts with the trainee and his/her organization.

International Clinical Guidelines	Placement of Guidelines (Name & Number of modules)
JNC 7 for Hypertension [26]	Basic concept in family medicine – Module # 2 & Non-communicable – Module #1, 2 and 3
ADA 2011 for Diabetes [27]	Non-communicable – Module # 1, 2 & 3
GINA for Asthma [28]	Non-communicable – Module # 1, 2 & 3
SIGN guidelines for obesity [29]	Non-communicable – Module # 3
European Guidelines for Nutrition [30]	Non-communicable – Module # 3
Canadian Guidelines for cigarette smoking cessation [31]	Non-communicable – Module # 3 & 6
ACC/AHA pocket guidelines for management of angina /MI [32]	Non-communicable – Module # 3
NICE guidelines for management URTI [33]	Communicable Diseases – Module # 4
SIGN guidelines for LRTI [34]	Communicable Diseases – Module # 4
NICE guidelines for infection control [35]	Communicable Diseases – Module # 4
NICE guidelines for management of TB [36]	Communicable Diseases – Module # 4
NICE guidelines for management of diarrhea and vomiting in children [37]	Communicable Diseases – Module # 4
CDC & WHO guidelines for management of STI (vaginal discharge) [38]	Communicable Diseases – Module # 4 & 6
NICE guidelines for management of UTI in children [39]	Communicable Diseases – Module # 4
NICE guidelines for low back pain [40]	Neurologic/Mental and Musculoskeletal Problems – Module # 5
NICE guidelines for osteoarthritis [41]	Neurologic/Mental and Musculoskeletal Problems – Module # 5
NICE guidelines for anxiety [42]	Neurologic/Mental and Musculoskeletal Problems – Module # 5
NICE guidelines for depression [43]	Neurologic/Mental and Musculoskeletal Problems – Module # 5
SIGN guidelines for management of headache [44]	Neurologic/Mental and Musculoskeletal Problems – Module # 5
British Society of Gastroenterology guidelines for management of iron deficiency anemia [45]	Gynecologic-Obstetric Problems – Module # 6
NICE guidelines for ante & postnatal care [46]	Gynecologic-Obstetric Problems – Module # 6
UNICEF/WHO guidelines for management of breast feeding [47]	Gynecologic-Obstetric Problems – Module # 6
WHO manual for family planning [48]	Gynecologic-Obstetric Problems – Module # 6
Joint Commission International Accreditation Standards for primary health care [49]	Quality Improvement & Professional development – Module # 7
National Clinical Guidelines	
The Saudi Initiative for Asthma (SINA) Guidelines [50]	Non-communicable – Module # 3
Antenatal Care [51]	Mother & Child Health care – Module # 6
Well baby care [52]	Mother & Child Health care – Module # 6
SHMS for Hypertension [53]	Non-communicable – Module # 3

Table 2: Clinical guidelines used in FAME

Evaluation methods

Course Evaluation
The learners using course-rating scales will evaluate each session of the course. Oral feedback will be collected from the learners at the end of the third day. Each trainer will prepare a personal report on the course mentioning possible areas to be improved. With the guidance of these reports, the course leader will prepare a final report for the course. Overall impact will be judged by a pre-implementation and post-implementation test and compared with a control group of matched general physicians from different areas.

Learner Evaluation
Learner evaluation will depend on the participation in the course. Learners are required to attend 90% of the sessions. It is not possible to repeat the course for non-attendees, and they will not receive the course certificate. However, they can apply to future courses. Formative evaluations will be performed continuously during the course modules. Each module also has a pre- and post-test for each participant. After every other module, the participants have to submit an assignment in order to earn the completion certificate for the full course.

CME Credit and Course Certificate
The Ministry of Health is responsible for the granting of CME credits and the course certificate. The course outline will be sent to the Saudi Commission for Health Specialties for approval and accreditation of CME credits. Successful participants will receive for each module their "course participation certificates". Those who participate in all seven modules of the FAME courses will receive the "Basic Family Medicine Training Certificate".

Discussion

In a modern health care system, professionals should provide primary health care services with specific education in this area. Hence, family medicine / general practice has been established in all developed countries as a separate discipline. Although the development of family medicine is strongly supported in the KSA, the current context does not allow primary health care services to be provided by family medicine specialists and overall the health system is run by general practitioners (GPs). It is not possible to fill the need for qualified family physicians quickly enough so the most reasonable way to contribute to the knowledge, skills, and attitudes of general practitioners (GPs) within these constraints is by performing regular continuous professional development (CPD) activities [14].

In order to implement Evidence Based Medicine (EBM) in routine general practice, an integrated approach on different levels needs to be developed [15]. There are several efforts to improve the qualifications of general practitioners (GPs) with the hope of promising results [16-18]. The need is actually for more than the enhancement of the knowledge, attitude and skills of GPs through a single course; perhaps it might be achieved by postgraduate training. More current initiatives in this regard are the development of a diploma program for primary care and continuous integrated courses for PC doctors [18], but again it is a full time 14-month course. In fact, the recommendation of the European Council seems to be more suitable, which says, "Receiving high quality health care is the fundamental right of every individual" [19] and this can only be achieved by vocational training for GPs that incorporates evidence based medicine.

The literature shows that there are many barriers to practicing EBM reported by physicians, and the lack of training in EBM (72.9%) is one of the major barriers [20]. Under the umbrella of the Ministry of Health, the General Supervisor of Postgraduate Centers of Family Medicine in Saudi Arabia sensed the responsibility to perform some CPD activities, which ultimately motivate the GPs to apply the practice guidelines in their day-to-day practice. This course is one of the series of courses planned to cover the learning needs of primary care physicians in the KSA, and it is an attempt to cover almost all aspects of family medicine and give more detailed emphasis to the concepts of the biopsychosocial approach in family medicine and clinical areas in primary care.

It is well known that adult learners have different needs than children [21] and even that each learner can have his/her own learning preferences [22]. Therefore, the major principles of this course are assisting GPs to use their experiences and learn in a more independent atmosphere and incorporate the widest variety of learning methods possible. Opportunities will be provided for the reinforcement of the learning. The trainers will be encouraged to apply the content learned and make contact with the training team whenever necessary. Continuous support will be promised and provided whenever necessary and possible. A mentorship will be developed and trainees will have opportunities to be in touch with trainers and try to update and maintain the continuity by submitting their assignments and getting feedback.

According to the study on the obstacles to Evidence-Based Practice (EBP) experienced by Belgian Dutch-speaking psychiatrists using grounded theory approach, there were three major obstacles: characteristics of evidence; characteristics of other partners in mental health care including government, patients and drug companies; discipline-related barriers including the complexity of diagnoses, the importance of the therapeutic relationship and personal experience [23]. In a questionnaire study out of all 650 Primary Health Care Patients practicing at the Ministry of Health Primary Health Care Centers in Riyadh region, Saudi Arabia, respondents in the study thought that the most appropriate way to move towards EBM was by learning the skills of EBM (43%), followed by using evidence-based guidelines developed by colleagues (37%) [24], which still gives hope to enhance the evidence-based practice in the family setting.

Putting evidence into practice and implementing clinical guidelines depends upon more than practitioners' motivation. There are factors in the local context, for example, culture and leadership, evaluation, and feedback on performance and facilitation, that are likely to be equally influential. [25]. The FAME program is at least trying to rectify problems such as training and continuous application for implementation of EBM.

This course is not only developed to give the benefit to family physicians; but also through this kind of course, we expect each stakeholder will benefit. Since the program includes trainees, trainers, regional supervisors, administrators, and policy makers, we anticipate that it would be advantageous for all. It is clear that all parties are aware of the importance of a well trained, standardized, and sufficient workforce in primary care to provide the highest quality health care to the public in a cost effective manner.

There is a long way to go with broad objectives, but it is important to start somewhere. This is a long walk, necessitating decades of planning with consideration of the learning curricula, teaching teams, collaborating centers for hospital training, monetary and other resources, as well as firm, sustained, and determined political support. In conclusion, the FAME courses will establish a well-structured training facility for GPs enabling them to become a standardized and high quality physician workforce in primary care.

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Continuity of Care for Iraqi Diabetics: How Important is it?

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Abstract

Background and Objectives: Continuity of care has a specific potential to improve quality care outcomes for persons experiencing chronic diseases. Nevertheless, studies have shown conflicting data regarding diabetes. This study aimed to identify patients who experience continuity with a physician in Iraqi National Diabetes Center (INDC) and to determine its contributory factors, and outcomes.

Method: A cross-sectional study was conducted on 400 diabetics attending INDC. The sampling method was carried out by systematic randomization technique. A semi-structured interview guide was used to collect information from participants. All variables were obtained through patients' self-report.

Result: The percentage of patients who had a personal doctor in INDC was 70.2%. They were more likely to be males, have higher education, and longer duration of diabetes; while being widowed or divorced was associated with lower probability. Patients reported better glycemic control and adherence to follow-up appointments as they had a personal doctor. No significant association was found between continuity and patients' satisfaction.

Conclusion: The findings of this study support the findings of previous studies in highlighting the importance and role of interpersonal continuity in diabetes care. Policy makers need to develop and activate programs to improve continuity of care between diabetics and their clinicians.

Keywords: Continuity of Care, Diabetes Mellitus, Doctor-Patient Relationship, Quality of Care

Introduction

Diabetes mellitus (DM) is a common and rapidly growing chronic disease[1]. People with diabetes are at increased risk of microvascular (retinopathy, nephropathy, and neuropathy) and macrovascular (atherosclerotic) complications[2]. High-quality medical care has been shown to reduce these complications [3, 4]. The American Diabetes Association has recommended monitoring diabetes and its complications through the use of periodic tests as well as appropriate management once complications are identified[5]. However, current data suggest that, even in developed countries, many diabetics do not receive optimal-quality health care[6-8], and satisfactory outcomes are rarely achieved[9].

Achievement treatment goals for diabetes mellitus require close cooperation among the patient, the physician, and other members of the diabetes care team during the long course of diabetic illness[10]. This process corresponds closely with the concept of continuity of care (COC) that is defined by the American Academy of Family Physicians as "the process by which the patient and the physician are cooperatively involved in ongoing health care management toward the goal of high quality, cost-effective medical care"[11]. That a considerable proportion of diabetic patients do not receive the recommended care and are at increased risk of developing complications of diabetes[6-9] suggests COC should be an important element in the management of DM.

Continuity of care has a specific potential to improve quality care outcomes for persons experiencing chronic diseases[12]. These diseases require considerable medical management[13, 14] which is likely to be easier when a patient is cared for by the same provider, as that provider would be more likely

to know when tests are needed and treatment changes are indicated. The influencing factors and benefits of continuity have been analyzed and registered individually for a number of chronic illnesses such as asthma[15] and hypertension[16]. Nevertheless, studies have shown conflicting data regarding diabetes[17-22].

Today, Iraq is undergoing epidemiological transition with an increase in the prevalence of chronic non-communicable diseases like diabetes mellitus[23]. The public health burden and costs of such diseases are significant and may become a major challenge to national development[24]. Keeping in touch with this situation, it becomes necessary to explore the area of continuity in an attempt to provide evidence that may help in dealing with such a problem. The aim of this study was, therefore, to identify patients who experience COC with a physician in Iraqi National Diabetes Center (INDC) and to determine the contributory factors, and outcomes of continuity.

Method

This study was conducted on diabetic individuals attending Iraqi National Diabetes Center during the period from September 2011 through to February 2012. A cross - sectional design with an analytic element was used, since we were interested in taking a general idea of patients' experience with continuity. Ethics approval for this research was obtained from the Ethics Review Board of INDC.

Sampling and Data Collection

The sampling method was carried out by systematic randomization technique. A sample size of 400 patients was estimated to give a 95% confidence interval of being within 5% of the true result based on population size.

All included subjects were patients over the age of 18 years, having a diagnosis of diabetes in their medical records, on medical treatment for DM, and registered in the center from more than one year. Patients were excluded if they had gestational diabetes, or having less than 2 visits within a year from the study because measures related to continuity cannot be assessed precisely for them. A semi-structured interview guide was designed and used to facilitate gathering of information from participants. The study instrument was piloted on different patients and minor revisions made. All variables were obtained through patients' self-report. Verbal consent was taken from respondents with reassurance that data gained would be kept confidential and not be used for other than research objectives. Interviews lasted for approximately half an hour.

Background information was collected on respondents' age, gender, marital status, and highest educational attainment. Other variables obtained were related to diabetes including type of DM and year of diagnosis; plus information concerning the duration, regularity, and frequency of attending INDC. Participants were then asked if they have a personal doctor in the center. Further questions examined patients' opinions on the level of medical care in the center and improvement in their glycemic control.

Statistical Analysis

Data were analyzed using SPSS/18 program. Pearson Chi-square x2 tests were used for cross tabulations. Logistic regression models were used to estimate odds ratio (OR) and 95% confidence interval (CI). The response variable in the logistic regressions was answer for the question 'do you have a personal doctor'. The explanatory variables were all treated as categorical variables (with indicator contrasts). Odds ratio of having a personal doctor in all categories of the explanatory variable were compared with the odds in the reference category of that variable after adjustment for age and gender. Results were considered statistically significant and highly significant at p-value less than 0.05 and 0.01 respectively.

Results

As mentioned previously, 400 patients have been recruited to be involved in this study (Table 1 - opposite page). Respondents were predominantly in their middle ages (55.8%), with equal sex distribution. Most were married (77.3%) and had at least primary school education.

Information regarding diabetes and relation with INDC are summarized in Table 2. The vast majority of patients had type 2 DM (88%) and around two-thirds of them were diagnosed with diabetes from less than one decade. Most of the patients started to attend the center in the last five years (70.8%), and visited it regularly (73.8%) according to follow-up appointments. The percentage of patients who reported having a personal doctor in INDC was 70.2 % (Figure 1 - page 24).

The relationship between reporting care from a personal doctor in INDC and patients' characteristics is outlined in Table 3 (page 24). Those with a personal doctor were less likely to be females (OR=0.576; CI: 0.372-0.890). As compared to those who were illiterate or semi-illiterate; those who had primary or intermediate schooling had 2.54 increased odds ratio (CI: 1.675-7.504), those who had secondary or technical schooling had 7.45 increased odds ratio (CI: 3.778-18.900), and those who had college or higher education had 6.28 increased odds ratio (CI: 3.091-17.188) for having a personal doctor. Concerning marital status and in comparison with married participants, being widow or divorced was significantly associated with lower probability of having a personal doctor (OR=0.499; CI: 0.254-0.981), while being single showed no difference (OR=1.233 CI: 0.519-2.929). Age factor was not significantly associated with having a personal doctor in INDC.

Table 4 (page 25) reveals factors related to diabetes disease for participants who had a personal doctor in INDC. The duration of diabetes mellitus showed only some association with interpersonal continuity. Patients with intermediate duration (6-10 years) had a significantly higher probability

Table 1: Baseline Characteristics

No. of participants	400
Male sex, n(%)	200(50.0)
Age, n(%)	
19 - 40 y	71(17.8)
41 - 60 y	223(55.8)
> 60 y	106(26.5)
Highest educational attainment, n(%)	
illiterate or semi-illiterate	42(10.5)
primary or intermediate schooling	137(34.3)
secondary or technical schooling	132(33.0)
college or higher education	89(22.3)
Marital status, n(%)	
married	309(77.3)
singles	33(8.3)
widowed	52(13.0)
divorced	6(1.5)

Table 2 Information Regarding Diabetes and Relation with INDC

Participants with Type2 DM, n (%)	352(88.0)
DM duration, n (%)	
1-5 y	145(36.2)
6-10 y	112(28.0)
11-15 y	70(17.5)
>15 y	73(18.2)
Duration of INDC attendance, n (%)	
1-5 y	283(70.8)
6-10 y	76(19.0)
>10 y	41(10.2)
Participants regularly attended the center, n (%)	295(73.8)

of having a personal doctor as compared to patients with short duration (1-5 years) of disease (OR=1.853; CI: 1.055-3.255), while those with longer durations show just an increase in the level of continuity without significant association. Type of DM and duration of center attendance had no association with having a personal doctor in INDC.

Continuity of care by patients' outcomes is illustrated in Table 5. Among those who had a personal doctor, adherence to follow-up appointments was significantly higher as compared to those without such a doctor (OR=2.117; CI: 1.320-3.396). A similar high significant positive association has been shown for improvement in glycemic control (OR=2.458; CI: 1.533-3.923). The opinion of patients with medical care offered by INDC, had no association with interpersonal continuity.

Discussion

This study explores a previously neglected area of concern in Iraq, the importance of interpersonal continuity and doctor-patient relationship in the management of diabetes mellitus. It reveals that, even in a health care system in which there is no obligation forcing individuals to attend the same doctor, the majority of diabetics choose to have a personal doctor. Several factors have been identified that influenced patients' probability of having a personal doctor in INDC. Participants were more likely to have a personal doctor if they were male, had higher education, or longer DM duration than others, while being widowed or divorced was associated with lower likelihood for having a personal doctor. Factors like age, DM type, and duration of center attendance were not found to have association. Continuity of care has led to positive results regarding patients' outcomes. Patients reported better glycemic control and adherence to follow-up appointments if they had a personal doctor. Even for opinion with medical care, the study has not found a negative effect of COC on patients' satisfaction.

Comparison with Existing Literature

The figure of 70.2% of respondents having a personal doctor in INDC is comparable to a previous cohort study conducted in 19 family practices in London [17], where 75% of diabetics experienced continuity during 10 months' follow-up. It is not clearly understood what creates a patient's desire for continuity. The sustained partnership over time between a clinician and patient is thought to lead to a bond between them, characterized by trust, loyalty, and responsibility [25, 26]. This personal relationship is even more valued in vulnerable groups such as patients with chronic conditions [26, 27].

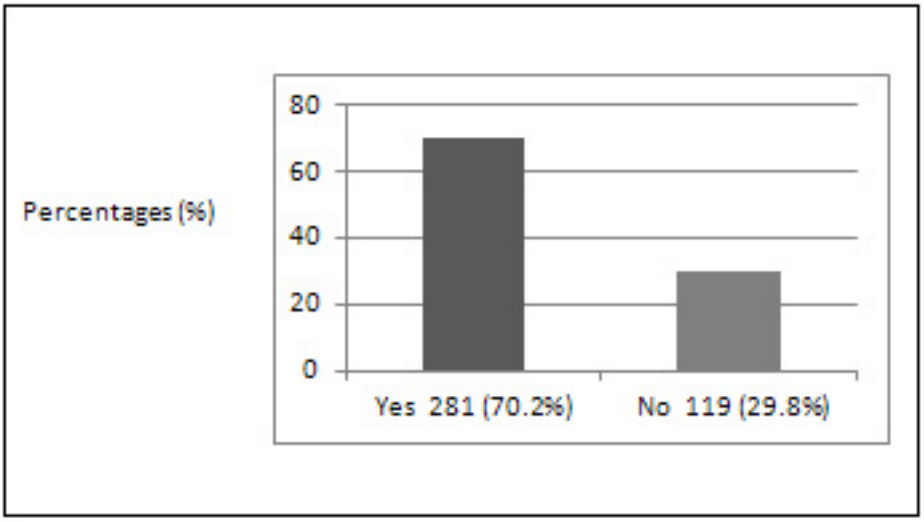

Figure 1:
Answers of Participants for the Question "Do You Have a Personal Doctor in INDC?"

Cross-Tabulate Analysis

Table 3: Logistic Regression for Relationship between Reporting Care from a Personal Doctor in NDC and Patient Characteristics

Study Sample, n=400 (numbers and percentages mentioned below concern participants who had a personal doctor in INDC)

Character	Number (%)	Adjusted OR (95% CI)	Significance
Sex			
male	152 (76.0)	1.00	
female	129 (64.5)	0.576 (0.372-0.890).	0.013
Age			
19-40 y	47 (66.2)	1.00	
41-60 y	160 (71.7)	1.302 (0.731-2.317)	0.370
>60 y	74 (69.8)	1.133 (0.592-2.169)	0.706
Education			
Illiterate & semi-illiterate	14 (33.3)	1.00	
primary & intermediate schooling	88 (64.2)	3.545 (1.675-7.504)	0.001
secondary & technical schooling	108 (81.8)	8.451 (3.778-18.900)	<0.001
college & higher education	71 (79.8)	7.289 (3.091-17.188)	<0.001
Marital Status			
married	226 (73.1) 1.00		
singles	24 (72.7)	1.233 (0.519-2.929)	0.636
others (widows & divorced)	31 (53.4)	0.499 (0.254-0.981)	0.044

Previous studies have shown apparently variable results regarding patients' characteristics associated with continuity. A review article concerning COC offered by Pandhi et al [26] has reported that continuity was more appreciated from seniors, females, and less educated people. However, another recent article presented by Pandhi and Saultz[27] has stated that those who felt unsafe if COC was to be disrupted were more likely to be females with no role for age, education or marital status. Another study presented by Wolinsky et al [28] has found that patients were more likely to have continuity if they were men, while widows and individuals who had never married were the least likely. Nevertheless, these diversities could be explained by the differences in cultural beliefs and socioeconomic environments encountered in each research. Concerning the current study, it seems that persons with higher ability for decision making were more likely to have a personal doctor.

The increase in the level of continuity with increased duration of DM could be attributed to increased probability of vascular complications and need for medications among diabetics over time [2]. These issues have been proposed to be synergetic factors that lead to increased demand for continuity in patients with chronic diseases[27,29]. The non-association of continuity with duration of INDC attendance is consistent with the literature[27] which suggests that the length of relationship with a provider, but not a place of care, was associated with COC.

The present findings of role of continuity in reinforcing the adherence to follow-up appointments are in keeping with Al-Azri beliefs[30] which considered the adherence to follow-up appointments as a way in which continuity improves quality of care. However, as our study is cross-sectional, it becomes difficult to determine whether adherence is a cause or effect of continuity.

Individuals who reported positive experiences of continuity were traditionally known to be more satisfied with medical care. These observations have been documented widely within multiple systematic reviews concerning continuity[12,31,32]. However, the current study failed in proving such an association. Although participants were generally more satisfied with medical care as they had a personal doctor, findings did not give statistical power or significance. These results may be attributed to the general political and security problems in Iraq which lead to increased prevalence of anxiety and obsession among people as has been found during the Iraq Mental Health Survey (IMHS)[33].

Continuity of care is generally known to enhance health status for people experiencing chronic conditions, primarily through its participation in improvement of the quality of care[12,34]. Regarding diabetes, it has been found to be associated with better glycemic control[18-19], reduced hospitalization[20-21] and overall mortality[20]. This has been suggested to be mediated by changes in patient behavior, especially those concerning diet[19]. However, still some studies pointed to the reverse in other aspects, like non-association with improvement in intermediate outcomes[17] or completion of monitoring tests[22], which indicate the need for more comprehensive work in this field.

Strengths and Limitations of the Study

To our knowledge, this is the first study implemented in Iraq concerning the subject of "continuity of care" among Iraqi people. Only one article has been found during our search, which demonstrated the effect of COC in the management of wounded American soldiers fighting in Iraq [35]. Nevertheless, the findings of that study could not be applied properly on Iraqi people.

Although the majority of patients attending INDC had type 1 or 2 DM, individuals with other metabolic disorders still came. Such minority groups were excluded as they did not fulfill the criteria for participation, e.g. duration less than one year for gestational DM, and no necessity for medications in impaired glucose tolerance.

Finally, participants were recruited from a single health care institution which was affiliated to the academic system. This problem may restrict the ability to apply the findings to patients seen in other health settings. On the other hand, the sampling of patients from a large outpatient clinic population, more than 25,000 records present in the center, with comprehensive management for diabetes could be regarded as a strength for the study.

Implications for Clinical Practice and Future Research

It is good to find that so many diabetics achieved the interpersonal continuity, giving the positive effects on outcomes reported by them. However, there is still room for improvement for others. Policy makers must attend to the needs of disadvantaged groups and take steps to encourage them to obtain the diabetic care from someone they know and trust. Such steps could involve minimizing complexity of service design and operating flexible appointment systems that permit booking appointments in advance. The use of mass media and health education programs to explain the benefits of COC is another way forward. Scopes for further research could involve inquiring of cause of low continuity among specific groups, effect of COC on cost and speed of access to health services, and physicians' opinions and attitudes towards continuity. It should be noted that we are not advocating 'mandatory personal care', but we want to enable diabetics to choose it.

Conclusion

The findings of the current study support the findings of previous studies in highlighting the importance and role of interpersonal continuity in diabetes care. Policy makers need to develop and activate programs to improve continuity of care between diabetics and their clinicians.

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What do new advances in geographical sciences and technologies offer global family medicine?

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Abstract

Recent advances in geographical sciences and technologies i.e. Geographical Information Systems (GIS) and further development of the Global Positioning System (GPS), offer family doctors, public health officers and non-government organizations (NGOs) valuable tools with which to study the 'place' component of public health problems, as well as areas in need of doctors and medical facilities. In this article we take a fresh look at some of these geographical sciences of relevance to family medicine, which include: detecting a hot spot of a given health problem, locally or regionally, and early detection of any changes in place or pattern of disease over time, for better planning of responses to these events.

Key words: Family medicine specialty and practice, Geographical Information Systems (GIS), Global Positioning Systems (GPS)

Introduction

Recent advances in geographical sciences and technologies provide an enhanced environment for acquiring a greater understanding of the relationship between health and place, to better meet the needs of global family doctors and their patients (1,2,3). The present article therefore looks at the facilities these advancements can offer to family medicine. Firstly it covers some background information related to new advances in geographical sciences and technologies, then it moves on to highlight those aspects related to the place side of public health problems that family physicians will now be able to better respond to, by applying these technologies.

GIS

A Geographic Information System (GIS), Geographical Information System, or Geospatial Information System is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographically referenced data. In the simplest terms, GIS is the merging of cartography, statistical analysis, and database technology.

A GIS system digitally creates and manipulates spatial areas that may be jurisdictional, or purpose or application-oriented for which a specific GIS is developed. Therefore, in a general sense, the term describes any information system that integrates, stores, edits, analyzes, shares and displays geographic information for informed decision making. GIS applications are tools that allow users to create search criteria, analyze spatial information, edit data, map and present the results of all these operations.

Common applications of the technology include: earth surface-based scientific investigations; resource management, reference and projections of a geospatial nature, both man-made and natural; asset management and location planning; archaeology; environmental impact-assessment; infrastructure assessment and development; urban planning; cartography, criminology; geospatial intelligence; logistics; population and demographic studies; prospectivity mapping; and statistical analysis.

The tremendous potential of GIS to benefit the health care industry is just now beginning to be realized. Both public and private sectors are developing innovative ways to harness the data integration and spatial visualization power of GIS. The types of companies and organizations adopting GIS span the health care spectrum, from public health departments and public health policy and research organizations, to hospitals, medical centers, health insurance organizations and NGOs. (4,5)

Current medical and public health uses include: Improved Workplace and Worker Safety Crisis Management; Infectious

Disease Surveillance; Interagency Healthcare Logistical Support during Emergencies; Location-Based Hazard Vulnerability Assessment Tools for Healthcare Facilities; Applications for Trauma Center Siting Healthcare Facility Disaster Planning: Identifying Alternate Care Sites or the closest clinic, planning for HIV/AIDS and family planning programs and analysis of the effects of environment on early childhood mortality, immunization programs. Researchers are also linking GIS with anemia prevalence data to model estimates of malaria endemic/epidemic and seasonality and intensity of transmission.

Left:
Figure 1: E. W. Gilbert's version (1958) of John Snow's 1855 map of the Soho cholera outbreak showing the clusters of cholera cases in the London epidemic of 1854

GPS

Figure 2: A GPS 'satellite'

The Global Positioning System (GPS) is a space-based global navigation satellite system (GNSS) that provides location and time information in all weather, anywhere on or near the Earth, where there is an unobstructed line of sight to four or more GPS satellites.

A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites above the Earth. General Relativity (GR) predicts that clocks in a stronger gravitational field will tick at a slower rate. Special Relativity (SR) predicts that moving clocks will appear to tick slower than non-moving ones. Remarkably, these two effects cancel each other out for clocks located at sea level anywhere on Earth.

As a feature of GPS is that it can be exported into a GIS format, the potential for these technologies to solve global health related problems is wide and these technologies are being used in many innovative global health solutions such as currently tracking the movement of drought affected people in the Horn of Africa by the UN agencies engaged in the current famine crisis, and allocating personnel, medical and food supplies accordingly. (6) High resolution imagery of locations with pressing humanitarian needs are being compiled and volunteers are mapping roads, hospitals, schools, community centers, and water resources among other vital landmarks. The data collected is being shared periodically with the UN agencies engaged in the famine crisis. (7)

The capability to export to different data formats allows maximum flexibility in handing data to various agencies or other software platforms. Exporting GPS data in the correct projection and datum is the most important component of any Export function.

The export software should also have the capability to output in the spatial coordinate projection and datum of the GIS.

Arguably a GIS/GPS system is most ideal for greater health needs of populations e.g. epidemics, famines, environmental and man-made disasters, logging disease and outbreaks (8).

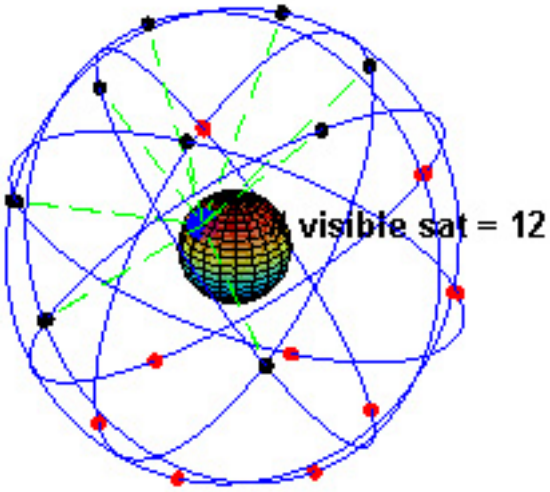

Figure 3: A visual example of the GPS constellation in motion with the Earth rotating

Family physicians and global healthcare needs

Family physicians while remaining responsible for the care and treatment of each person in their local catchment area, should also be aware of the regional and global picture i.e. the relationship between people and disease and its place within the general environment (9).

Evidence suggests that most public health problems are related to 'place' i.e. where a person is born, lives and works. The concept of place is rather more than the geographical place per se. It might include the relationship between people and also between people and their environment and between disease and the environment. Environment is also a rather comprehensive concept which might also cover physical, biological, chemical, climatological, economical and social components (10,11,12).

This means that the health of a person is intertwined with his or her place on both the micro and macro scale, in its bigger concept. Therefore, family physicians should not only comprehend this vital relationship but also be able to investigate scientifically the relationship between health and place. This helps to achieve a better understanding of links between health phenomena and environment and to design the necessary investigations and interventions in order to promote the level of health in the served communities (13).

Examples of such use may be plotting of disease spread through a local region to allow authorities to better plan a response, the linking of health department (DHS) data with routine health data, health facility locations, land use, local infrastructure, and environmental conditions.

An interesting recent enhancement of GIS is the development of wearable GPS devices.

Rather than rely on static areal units as proxies for places, wearable devices can be used to derive a more complete picture of the different places that influence an individual's wellbeing. The measures are objective and are less subject to biases associated with recall of location or misclassification of contextual attributes. This is important for two reasons. Firstly, it brings a dynamic perspective to place and health research. The influence of place on health is dynamic in that certain places are more or less relevant to wellbeing as determined by the length of time in any location and by the frequency of activity in the location. Secondly, GPS data can be used to assess whether the characteristics of places at specific times are useful to explain variations in health and wellbeing.

An increasing number of studies suggest that characteristics of context, or the attributes of the places within which we live, work and socialize, are associated with variations in health-related behaviours and outcomes. The challenge for health research is to ensure that these places are accurately represented spatially, and to identify those aspects of context that are related to variations in health and amenable to modification. (13)

The integrated use of these new advances, have greatly improved the following shortcomings of studying the place side of public health problems:

1. **Where exactly a public health problem has occurred.**
2. **How can we produce a high resolution map or other means of conveying statistical data of health problem events?**
3. **How can we spatially analyse the relations between events and places?**

By removing the above-mentioned shortcomings, public health professionals, including family physicians, are now able to answer some of the old but important questions related to the place side of public health problems.

In what follows three of the most important questions will be discussed:

Question 1. Is there a hot spot of a given health problem?

Hot spots of a given health problem or disease, e.g. traffic accidents, leukemia, suicide, dengue fever, T.B. etc., are those places which demonstrate a higher number or rate of the problem that has occurred

in a level that cannot be explained by chance alone (2). The issue of detecting a hot spot or a cluster of events is among one of the most important issues related to place which often arise at the population level (14,15).

Since hot spots can be investigated in different ways according to the nature of data we should first recognize different types of spatial data. Although there are different types of data, two of them i.e. point and count data, are the most important since public health spatial data usually gathers as point data e.g. the exact location of an event such as a suicide or traffic accident and area data e.g. the number of suicide cases or traffic accidents in a given district (16).

Scholars invent different methods of detecting types of clusters for both point and area data using new advances in geographical sciences and technologies. For example, for assessing the localized clustering in point data the geographical analysis machine (17) and the spatial scan statistic (2518) were invented, while in order to detect any global clusters in area data, spatial autocorrelation statistics such as Moran I statistic (2619) and Geary's c statistic were developed (2720).

Question 2. Is there a change in pattern of disease over time?

Another important question that a family physician might come across in his/her practice is whether there is a change in the pattern of a given disease or injury, over time, in a certain place. The element of time plays an important role in such situations. Additional to the other two questions in which we investigate the place side in a rather cross sectional domain, here we consider a longitudinal type of study in which a cohort is followed up over time to see whether a change in incidence of disease has occurred (21).

To meet this demand, new technologies provide an environment to design appropriate surveillance systems to closely monitor any changes in the pattern of the environmental related health problems (22) such as climate-related health vulnerabilities (23), surveillance of infectious disease, especially zoonoses including rabies (24) and monitoring any public health impacts and consequences of natural disasters (25).

Question 3. Where to locate a new family physician clinic?

This is an important question whenever a new clinic or a hospital is to be established. The scientific answer to this vital question is nowadays possible using new advances in geographical sciences and technologies. For doing so, evidence suggests that there are two vital rules that should be considered, especially within developing countries. Firstly, the given clinic or hospital should be placed in an area within the district in which most people in need live. Secondly, in that selected area, the most appropriate place would be a location that is easily accessible, including by public transport, and have the minimum possible distance to the living places of people in need (26, 27).

Fulfilling both requirements needs extensive analysis, considering so many variables, including distance and travel time, and using appropriate models such as location-allocation models and new advances in geographical sciences and technologies have now made all these analyses possible (28). There are different examples in which the investigators apply successfully these new technologies for locating a hospital and other health services within communities (29,30,31) and also to recognize geographic districts where various people may not be able to access suitable primary care services (32).

Safeguards

While the advantages of combining two such global information systems as GPS and GIS are substantial, the tracking of various human activities and generating data thereon, can also generate problems of invasion of privacy, third party or commercial use of the data and integrity of those who hold the data. GPS and similar technologies were originally developed for purposes of warfare so we therefore need standards and guidelines governing the use of such data in the same way as we already protect the health data of patients.

Conclusion

Geographical sciences and technologies have witnessed rapid advances during the past four decades. These advances herald a new era in which the family physician, like other public health specialists, is able to investigate scientifically the role of place in human health. It helps them to better understand the relations and links between place and the health of individuals, families and communities in order to manage the existing resources more expediently and to implement thoughtful public health interventions, in a timely and efficient manner.

Evidence suggests that the gap in health between poor and rich is increasing everywhere and it is timely to deal with such health inequalities especially through primary care (33). New advances in geographical sciences and technologies can help primary care specialists to determine and respond to hot spots of health problems which in themselves are reflections of health inequalities. This will allow primary care specialists to shift existing resources to those more needy areas, for example by establishing new primary care clinics in the best possible places.

Since applications of any new technologies require additional help from relevant professionals, family physicians need to look for such help in their practice areas. This could occur either directly through collaboration with other professionals in searching the role of place in health, or indirectly by taking relevant courses and workshops to get familiar with different applications of these advanced technologies.

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Impact of Work on Pattern of Breast Feeding

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Abstract

Objectives: To explore the pattern of breastfeeding in working and non-working mothers and the factors specifically related to work and breastfeeding.

Methodology: A cross-sectional survey was carried out at well baby clinic and employee health clinic in King Abdulaziz Medical City and well baby clinic at Health Care Specialties Clinic (HCSC), Riyadh city, Saudi Arabia, from June to December, 2008. Nearly 200 questionnaires were filled out by the mothers and by face to face interview. Questions on demographic data for mothers and children, pattern of breastfeeding, support from family, working hours, maternity leave, change in work shift, availability of lactation room at work place were included.

Results: The non-working mothers were 3.6 times more likely to be breastfeeding their children when compared to the working mothers (p <.001). The working mothers were more likely to bottle-feed their child than non-working mothers and less likely to breastfeed (p <.05). Nearly 50% of the women were not breastfeeding their infants after 7 months of age. Over two-thirds were not breastfeeding when the child was between 7-18 months and only 12% continues to breastfeed after the child was 18 months old (p <.001). Among the working mothers as the age of the child goes beyond 6 months, the breastfeeding drops from 45% to less than 10%.(p<.002). Working mothers were less likely to get encouragement from their husbands to breastfeed (p <.001). Women working 7 hours or less were more likely to breastfeed than those working 9 hours daily (p .002). However if the mother took breastfeeding breaks at work, it helped current breastfeeding (p .036). In addition, the ability to take breastfeeding breaks was strongly related to facilitation by the employer (p <.001).

Conclusion: Breastfeeding is poor in both working and non-working mothers. Work has a negative impact on breastfeeding pattern, however, lesser working hours, breastfeeding breaks and support from employers may help in restoring some breastfeeding patterns.

Keywords: Breastfeeding, lactation, maternal employment.

Introduction

The World Health Organization Expert Consultant Panel on the Optimal Duration of Exclusive Breastfeeding recommended in 2001 that infants should be exclusively breastfed during the first 6 months of life, instead of the previous recommendation of 4-6 months, and that they should continue to receive breast milk throughout the remainder of the first year and during the second year of life (1, 2).

Breastfeeding confers health advantages on the mother by helping her regain her pre-pregnancy weight and long-term reduction of risks of developing ovarian cancer, premenopausal breast cancer and osteoporosis (3).

An Australian study in 2003 showed that breast feeding initiation rates are relatively high , with >80% of women leaving the hospital breastfeeding, but afterward fewer than half of infants receive any breast milk at 6 months (4).

Miller and colleagues reported a breastfeeding initiation rate of 80% among resident physicians in 1996 in a random selection of American graduates (5).

A study published in the Canadian Journal of Public Health in 2003 assessed the main social determinants in the general population of Quebec of initiation, duration, and exclusivity of breastfeeding from birth to 4 months. It found that Mother's education level and age were the most important factors for initiation and duration of breastfeeding up to 4 months. Annual family income showed a negative relationship with breastfeeding when mothers' ages and education levels were equal (5).

The International Labor Organization (ILO) recommends a period of maternity leave of not less than 14 weeks. The promotion of breast-

feeding is a global priority, because of its many benefits to infant and mother.

Arthur et al found a breastfeeding initiation rate of 93% among physician mothers living in Mississippi, with the mean duration of breastfeeding being 18.8 weeks without a significant relationship between part-time or full-time work, length of maternity leave, and duration of breastfeeding (6, 7). Gielen et al have suggested that early return to work adversely affects initiation and continuation of breast-feeding (8).

Another study indicated that more flexible working conditions, including increased opportunities for part-time work, improved conditions at work for breastfeeding, and breastfeeding breaks at work, will help to support breastfeeding among women who work outside home (9).

Freed et al, in a US study, reported that residents and physicians with personal experiences of breastfeeding were more confident providing support and advice to breastfeeding patients (10).

In Saudi Arabia, one study showed that approximately 73% of the mothers breastfeed their children initially but only 37.6% were breast feeding their children at the age of 6 months and the mothers' educational level was the most important factor associated with mothers' practice(11).

Another study was done to show the pattern of breast feeding during the first 6 months only and found that, the higher education level of the mothers, the more likely they would be working. This possibly could be the real reason behind the reduction of lactation among the educated women (12).

Study Objectives

1. Primary objective: To explore the pattern of breastfeeding in working and non-working mothers
2. Secondary objective: To explore the reasons that influence breastfeeding practice of mothers, specifically related to work.

Methodology

Design:
It is a cross-sectional study design using a survey questionnaire.

Participants:
The subjects included the mothers who had children aged 3 years or less, attending well baby clinic and employee clinic in King Abdulaziz Medical City and well baby clinic at National Guard health specialty clinic (HCSC).

Sample Size:
Total sample size is 200 mothers.

Setting:
The study was conducted at King Abdulaziz Medical City, National Guard health specialty clinic (HCSC), Riyadh city, Saudi Arabia.

Data collection procedure
The survey form was distributed and data was collected from June 1 to December 29, 2008. The study was conducted by questionnaire, which was designed based on existing literature and validated questionnaires from previous research and was self-administered. The questionnaire for the study was prepared in English and then translated into Arabic. Mothers were conveniently sampled from those randomly visiting the clinic on a daily basis and interviewed personally when necessary.

Data Collection Instrument
Demographic data for mothers and children, pattern of breastfeeding, support from family, type of delivery and initiation of breastfeeding were asked among the mothers (see Appendix: Questionnaire). Special questions for working mothers, which included working hours, length of maternity leave, change in work shift, lactation breaks, presence of lactation room at the work place and its utilization by the mothers, were asked. A small pilot study of 10 persons was carried out to check the appropriateness and the clarity of the questions.

Statistical analysis
Statistical analysis was performed using SPSS 14. Descriptive statistics such as frequencies, percentages and counts of most variables in the questionnaire were carried out. Comparison between variables was carried out by using Chi-square and T-tests where applicable, and statistical significance was assigned at p less than 0.05.

Ethical Statement:
The research was approved by the departmental research committee. All data was maintained in a secure fashion as per policy. All data was analyzed and presented collectively in a manner so that individual privacy was protected.

Results

The results are arranged as follows:

1. Socio-demographic characteristics of the mothers in the study.
2. Pattern of breastfeeding among working and non-working mothers
3. Child factors influencing breastfeeding patterns
4. Childbirth and breastfeeding initiation
5. Family support regarding breast feeding
6. Factors at work that may influence breastfeeding

Socio-demographic characteristics of mothers:
A total of 200 mothers participated in the study, of which 139 (69.5%) mothers were non-working while 61 (30.5%) mothers were working. Table 1 gives the socio-demographic characteristics of the mothers. Eighty-seven percent of mothers were Saudi. Only 26.5% of the mothers were illiterate while 73.5% had some form of education.

Fifty-eight of the working mothers had education at university level, 18 of the 76 women with university level education and above were not working at the time of interview. Among the non-working mothers 52 of the 139 mothers were illiterate while 87 mothers had some form of education, (Table 2).

Mothers' characteristics	Number (200)	Percentage %
Nationality		
Saudi	174	87.0
Non-Saudi	26	13.0
Level of Education		
Illiterate	53	26.5
Primary school	14	7
Intermediate school	29	14.5
Secondary school	28	14.0
University	76	38.0
Occupation		
Housewife	131	65.8
Health care professional	43	21.6
Teacher	16	8.0
Student	7	3.5
Others	3	1.5

Table 1: Socio-demographic Characteristics of the Mothers

Education level	Working mother(no.)		Total
	Yes	NO	
Illiterate	1	52	53
Primary	0	14	14
Intermediate	0	29	29
Secondary	2	26	28
University & above	58	18	76
Total	61	139	200

Table 2: Education level and Working status

Education level	Working & non working mothers (no.)	Mean of age (years)	Range of age (years)
Illiterate	53	28.98	18-45
Primary	14	27.29	14-40
Intermediate	29	24.28	18-38
Secondary	28	25.89	20-40
University & above	76	30.59	21-43
Total	200	28.36	14-45

Table 3: Education Level & Mean of Age for Working and Non-working Mothers

The mean age of non-working mothers was 27.3 years while working mothers were older by 3.35 years (T-test 3.5, p-value .001).

Age difference (4.6-6.3 years) was significant between those with secondary/intermediate education and those with university background (p<.004). No statistically significant difference however was found between the ages of women who were currently breastfeeding their child or not.

Pattern of breastfeeding among working & nonworking mothers:

Working status	Breastfeed at present No. (%)		Total=(no)
	No	Yes	
No	74(53.2%)	65(46.8%)	139
Yes	49(80.3%)	12(19.7%)	61
Total	123(61.5%)	77(38.5%)	200

Table 4: Relationship between Work status and Breastfeeding

As we can be seen in Table 4, the Non-working mothers were 3.6 times more likely to be breastfeeding their child when compared to the working mothers (Chi-Sq = 13.14, p <.001) (Odds Ratio = 3.6 (CI: 1.76-7.33).

Working Mother	Milk Feeding Categories No. (%)			Total (No.)
	Breastfeed	Combined	Bottle-feed	
Yes	6(9.8%)	24(39.3%)	31(50.8%)	61
No	35(25.2%)	67(48.2%)	37(26.6%)	139
Total	41(20.5%)	91(45.5%)	68(34.0%)	200

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No	35(25.2%)	67(48.2%)	37(26.6%)	139
Total	41(20.5%)	91(45.5%)	68(34.0%)	200

Table 5: Work status of Mother and Milk Feeding Categories

Table 5 shows that working mothers are more likely to bottle-feed their child than non-working mothers and less likely to breastfeed as a way to deliver milk to their child (Chi-Square = 12.91, p .002). Working status of mother had no significant effect on use of breast pump, or child age of starting solid food (5 months).

Nearly 50% of the women are not breastfeeding their infant less than 7 months of age; over two-thirds are not breastfeeding when the child is between 7-18 months and only 12% continue to breastfeed after the child is 18 months old (Chi-Square = 17.74, p <.0001).

There was a difference of 7 months in the age of the child between mothers currently breastfeeding their children (age 6 months) with those not breastfeeding (age 13 months), (T-test 4.75, p <.0001).

Non-working mother Chi-Square = 3.95, P-value = 0.139

Working Mother Chi-Square = 12.26, P-value = 0.002

On further analysis, it was shown that there was no statistically significant difference in the ages of children breastfed by non-working mothers while among the working mothers as the age of the child goes beyond 6 months, the breastfeeding drops from 45% to less than 10%, as shown in Table 7 (Page 39).

We noticed that, the breastfeeding pattern among non-working mothers remains around 50% up to 18 months of child age. It drops to nearly 25% afterward, however this difference is not statistically significant. (See Figures 1 & 2 pages 38 and 40)

As summarized in Table 8, over 75% of the women whether working or not, had a strong intention to breastfeed their child, however intention did not have any statistically significant affect on whether the mother was currently breastfeeding or not, irrespective of work status.

Child factors influencing breastfeeding pattern:
Demographic characteristics of children showed that 45% were male while 55% were female .The majority of children were single and full-term and with normal delivery and without complications, as seen in Table 9 (page 41).

Further analysis showed the gender of child was of no statistical significance on the current breastfeeding patterns of mothers, irrespective if the mother worked or not.

Child Age (Months)	Breastfeed at present no.(%)	
	No	Yes
0-6	53 (49.5)	54(50.5)
7-18	40(67.8)	19(32.20)
> 18	30(88.2)	41(1.80)
Total	123(61.5)	77(38.5)

Table 6: Child Age Groups and Mothers Breastfeeding at Present

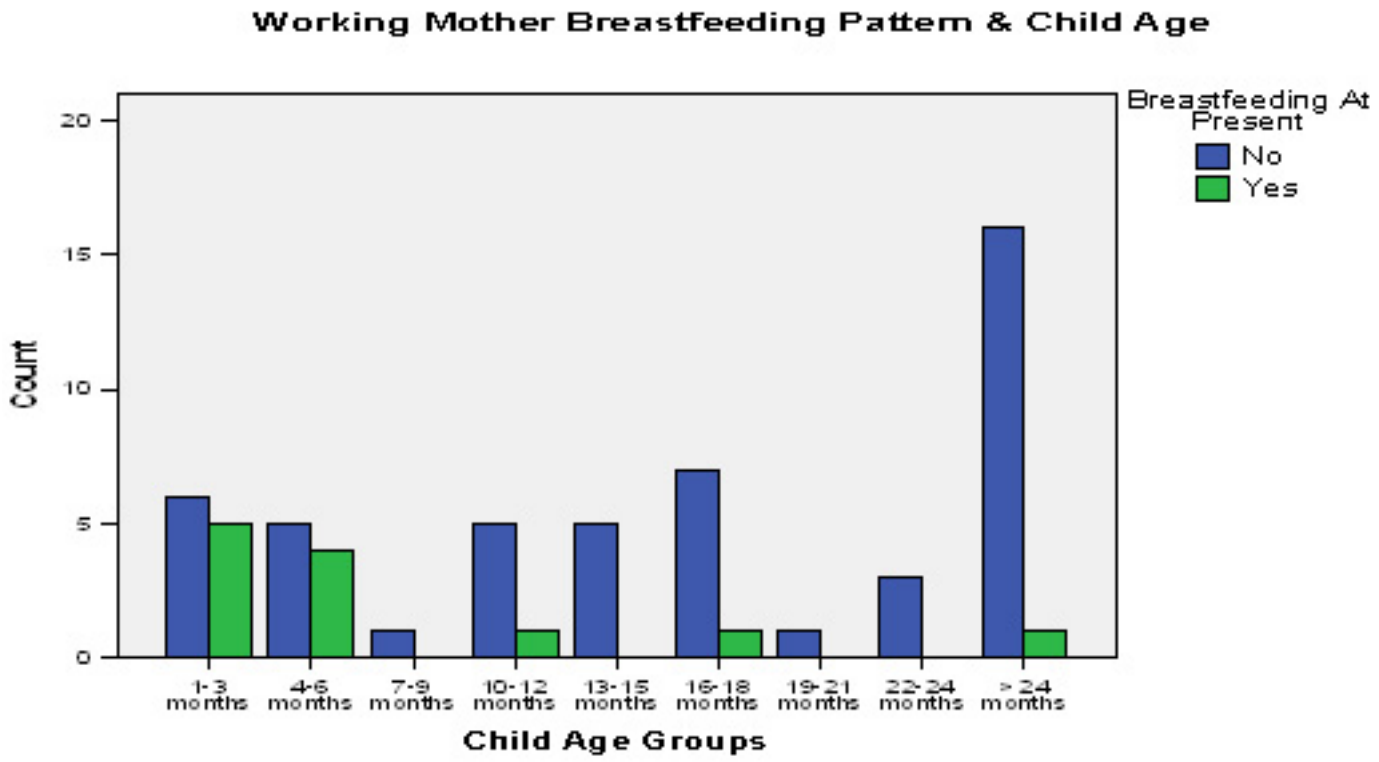

Figure 1: Working Mothers' Breastfeeding Pattern and Child Age

Working mother				Are you breastfeeding your child at present?		Total
				No	Yes	
No	Child Age Large Groups	0-6m	Count	42	45	87
			% within Child Age Large Groups	48.3%	51.7%	100.0%
		7-18m	Count	22	17	39
			% within Child Age Large Groups	56.4%	43.6%	100.0%
		>18m	Count	10	3	13
			% within Child Age Large Groups	76.9%	23.1%	100.0%
	Total		Count	74	65	139
			% within Child Age Large Groups	53.2%	46.8%	100.0%
Yes	Child Age Large Groups	0-6m	Count	11	9	20
			% within Child Age Large Groups	55.0%	45.0%	100.0%
		7-18m	Count	18	2	20
			% within Child Age Large Groups	90.0%	10.0%	100.0%
		>18m	Count	20	1	21
			% within Child Age Large Groups	95.2%	4.8%	100.0%
	Total		Count	49	12	61
			% within Child Age Large Groups	80.3%	19.7%	100.0%

Child Age Large Groups * are you breastfeeding your child at present * Working mother

Table 7: Child Age Groups and Breastfeeding of Working and Non-working Mothers

Mothers with more children were more likely to be currently breastfeeding (Chi-Square = 15.16, p <.001) See Table 10 - page 41. Working mothers were more likely to have fewer children (Chi-Square = 7.58, p .023).

Childbirth & Breastfeeding Initiation
Non-working mothers were more likely to have normal delivery as compared to working women who had a higher C-section rate (Chi-sq 23.7, p <.001) (OR 7.04(CI: 2.98-16.68)).

No significant pattern was found between having a child born with complications or prematurity and the type of delivery. Type of delivery had no impact on current breast feeding patterns despite work status of mother; however children born with normal delivery were 2.7 times less likely (OR CI: 1.2-6), to have difficulty latching on the mother's breast (Chi-sq 6.12, p <0.014).

Type of delivery or intention to breastfeed had little effect on the mother's ability to feed colostrum to her child after birth. Current breastfeeding had no relationship with the mother's ability to feed colostrum to child after birth.

In our study, admission to nursery, child's pre-maturity or having complications, had no statistically significant affect on the child's ability to latch onto the breast of the mother, however difficulty to latch on the mother's breast had significant impact on whether the mother was currently breastfeeding her child or not (Chi-Square = 10.94, p <.001).

Working mothers found more difficulty in latching their child to the breast than non-working mothers (Chi-Square 14.65, p <.001).

Table 11 (page 42) shows that women who had normal delivery, as opposed to C-section were more likely to breastfeed colostrum to their baby.

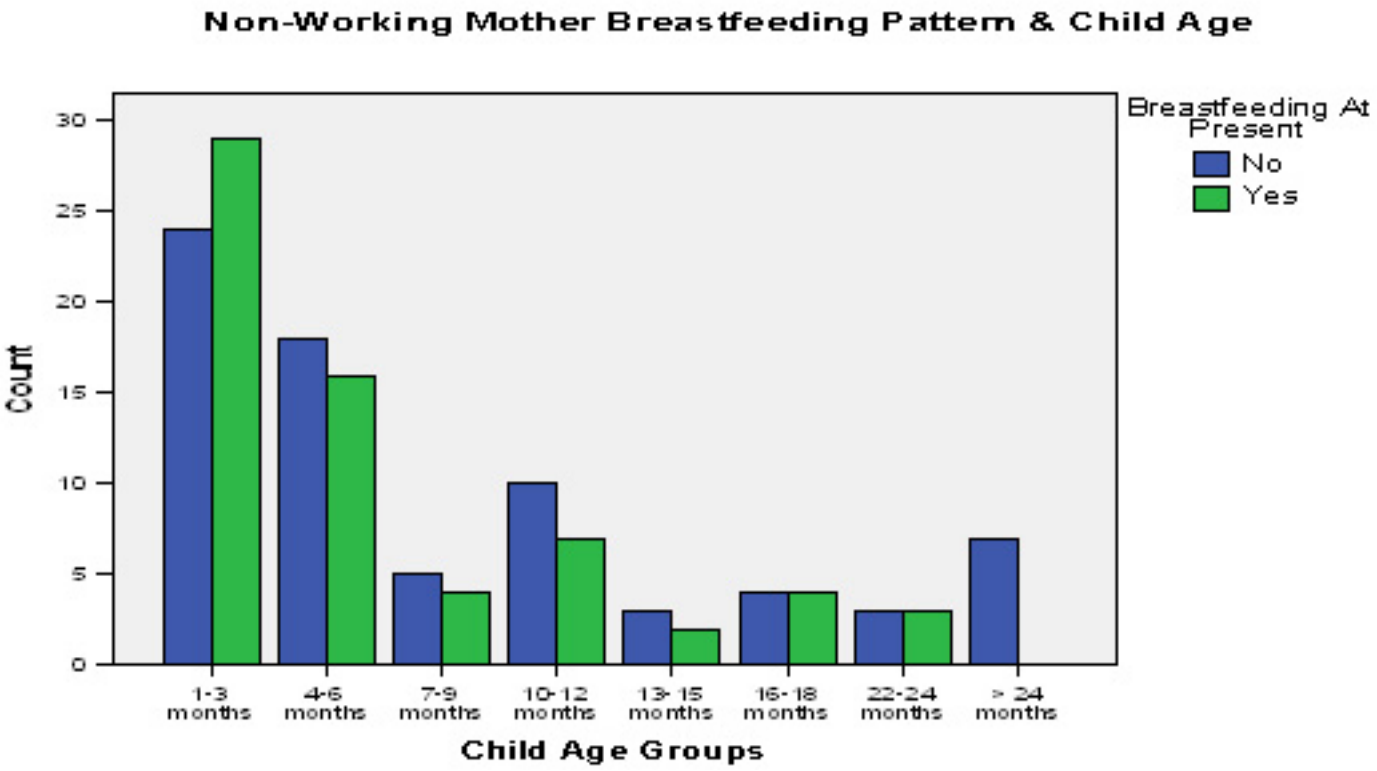

Figure 2: Non-working Mothers' breastfeeding pattern and Child Age

Intention to breast feed	Working mothers		P-value
	YES(n=61)	NO(n=139)	
Strong intention	51	103	0.09
Some intention	9	36	

Table 8: Relationship between Intention to Breastfeed and Working Status

Family Support for Breastfeeding
Support from husbands had no impact on whether a mother was currently breastfeeding or not, however working mothers were less likely to get encouragement from their husbands to breastfeed (chi-sq 14.7, p <.001). (See Table 12 - page 42).

Only 7.5% of women actually received any discouragement regarding breastfeeding but it had no effect on current breastfeeding patterns.

Job-Related Factors Affecting Working Mothers:
As can be seen in Table 13 (page 43), women who were currently breastfeeding had mean working hours of 7 in comparison to those who were not breastfeeding currently and worked an average of more than 8 hours daily.

Mean difference between working hours of those currently breastfeeding their child or not was 1.81 hours (8.73-6.92) (T-test 3.15, p .002). Further analysis showed that length of maternity leave, having lactation room at workplace or using breast pump at workplace had no significant impact on current breastfeeding patterns. However if the mother took breastfeeding breaks at work, it helped current breastfeeding (Chi-sq 5.15, p .023). In addition, the ability of taking breastfeeding breaks was strongly related to facilitation by the employer (Chi-sq 17, p <.001).

Child characteristics	No.	%
Gender		
Male	90	45
Female	110	55
Twins		
Yes	1	.5
No	199	99.5
Child premature		
Yes	7	3.5
No	193	96.5
Type of Delivery		
Normal	171	85.5
c/section	29	14.5
Child with complications		
Yes	9	4.5
No	191	95.5
Child admitted in nursery		
Yes	38	19
No	162	81

Table 9: Child Characteristics

Siblings numbers	Currently breastfeeding	
	NO	YES
>4	5(23.8%)	16(76.2%)
3-4	37(60.7%)	24(39.3%)
0-2	81(68.6%)	37(31.4%)

Table 10: Number of Siblings and Currently Breastfeeding

			Able to breastfeed colostrum to Baby		Total
			No	Yes	
Type of Delivery	Normal	Count	27	144	171
		% within Type of Delivery	15.8%	84.2%	100.0%
	C-Section	Count	9	20	29
		% within Type of Delivery	31.0%	69.0%	100.0%
Total		Count	36	164	200
		% within Type of Delivery	18.0%	82.0%	100.0%

Table 11: Type of Delivery and Ability to Breastfeed Colostrum to the Baby?
Chi-square = 3.9, P-value = .048

Working Status	Husband supports breastfeeding		Total (NO.)
	YES	NO	
Non-working	134	2	136
Working	50	9	59

Table 12: Husband Support in Working and Non-working Mothers

Discussion

This study provides information not previously available from studies done in Saudi Arabia on pattern of breastfeeding in working mothers and presence of workplace facilities e.g. lactation room, breaks hours. In our study sample number of non-working mothers was 2.3 times the number of working mothers, who were 30.5% of those interviewed.

58 mothers out of the working mothers had education at university level; 18 mothers of the 76 women with university level education and above were not working at the time of interview. Among the non-working mothers 52 of the 139 mothers were illiterate, while 87 mothers had some form of education.

In our study, the most common reason why the mother was not able to breastfeed her child, was not enough milk (inadequate milk). This finding is consistent with other studies (12).

Although, internationally, it is promoted that women should exclusively breastfeed their infants for up to 6 months of age and that

Number of Working Hours	Currently breastfeeding	
	NO	YES
>8	35(94.6%)	2(5.4%)
7-8	7(58.3%)	5(41.7%)
≤ 6	7(58.3%)	5(41.7%)

Table 13: Relationship Between Working Hours And Currently Breastfeeding.

Chi-Square 12.11, p value .002.

breastfeeding should continue into the second year of a child's life and for longer, if possible or desired (1,2), in our study, relatively few women achieved these targets and, among the working mothers as the age of the child goes beyond 6 months, the breastfeeding drops from 45% to less than 10 % (p .002). This finding is nearly similar to other studies (13,14).

In our results nearly 50% of the women are not breastfeeding their infant less than 7 months of age; over two-thirds are not breastfeeding when the child is between 7-18 months and only 12% continue to breastfeed after the child is 18 months old (p <.001).

A study done in 2006 indicated that just under half of infants were still receiving some breast milk at 6 months (45.9%) and only 12% were being fully breastfeed. By 12 months, only 19.2% of infants were still receiving any breast milk (15). Another study showed about 31% of nonworking mothers breastfed for up to 6 months as compared to 20% of working mothers (16).

Some studies showed that higher maternal education is associated with longer duration of breastfeeding (16, 17).

A study has shown that, length of maternity leave, having lactation room at workplace or using breast pump at workplace had no significant impact on current breastfeeding patterns, similar to another study (18). In our study, 10% of working mothers used the lactation room, similar to the above study that showed only 10.6% continued to breastfeed after returning to work, despite the provision of lactation rooms and breast pumping breaks.

However our study results were not consistent with those found by others that mothers who express breast milk were less likely to discontinue any breastfeeding before six months (19).

However, in our study if the mother took breastfeeding breaks at work, it helped current breastfeeding (p value .036). This finding is supported by one study which indicated that more flexible working conditions, including increased opportunities for part-time work, improved conditions at work for breastfeeding, and breastfeeding breaks at work, and helped to support breastfeeding among women who work outside the home (9) . In addition, our study showed that the ability to take breastfeeding breaks was strongly related to facilitation by the employer (<.001).

Women who were currently breastfeeding had mean working hours of 7 in comparison to those who were not breastfeeding currently and worked an average of more than 8 hours daily (p value 0.002). This result is close to another study which showed that 83.3% of the mothers breastfed for 7 months or longer if their partners worked part-time (20). This is also in agreement with other findings which included increased opportunities for part-time work (9).

In many studies intention to breastfeed is described as "attitude", or "feeding preference". In our study, over 75% of the women had a strong intention to breastfeed their child. This finding is in agreement with another study (21). However, intention to breastfeed did not have any statistically significant affect on whether the mother was currently breastfeeding or not, irrespective of work status.

A study presented that breastfeeding duration was independently, positively associated with maternal feeding attitude and negatively associated with breastfeeding difficulties in the first 4 weeks, and early return to work (15). One study done in Jeddah, showed a preference of mothers for breastfeeding although it was not significantly related to age, income, parity, and education level (22).

In our study, support from husbands had no impact on whether a mother was currently breastfeeding or not, however working mothers were less likely to get encouragement from their husbands to breastfeed (p <.001) as shown in another study (23). This finding is inconsistent with other studies which found a positive correlation between father support and breastfeeding (24, 25).

Conclusions

This study highlights that breastfeeding rate is poor in both working and non-working mothers. Overall, 50% of the women are not breastfeeding their infants less than 7 months of age, over two-thirds are not breastfeeding when the child is between 7-18 months and only 12% continue to breastfeed after the child is 18 months old.

The work has negative impact on breastfeeding pattern because among the working mothers, as the age of the child goes beyond 6 months, the breastfeeding drops from 45% to less than 10 % , which is due to more working hours and breastfeeding breaks not allowed and no support from employers. However, lesser working hours, breastfeeding breaks and support from employers may help in restoring some breastfeeding patterns.

Also it is important to have more comprehensive lactation measures and a flexible environment in the workplace to support working mothers in continuing to breastfeed after returning to work.

Limitations

1. Our study was done among the National Guard population which cannot represent the whole population in Saudi Arabia.

2. We had a relatively small sample size. A study conducted on a larger and more diverse sample of working mothers may improve on this study.

'Research Questionnaire: Breastfeeding and Work' can be found at the end of this article.

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Diagnosis and Management of Short Stature

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Abstract

Short Stature can have intense implications on the psychosocial health of children and adolescents. The consequences can be far reaching, affecting even adulthood. The aim of this review is to provide an up to date diagnostic and management approach to this common pediatric presentation.

This review provides an explanation of the definitions and the terminologies associated with short stature. An evidence based approach is outlined and the common treatment options are discussed.

Introduction

Short Stature (SS) is one of the most common presentations seen in pediatric endocrine clinics (1). This common complaint is challenging even to the experienced pediatric endocrinologist(2). The differential diagnosis is wide and one or multiple mechanisms can be involved in one patient. The first encounter with the patient may not reveal the cause, and careful follow up over months or years is often required.

Short stature has become a public health issue. Living with short stature involves potential risks to psychological functioning and quality of life(3). In the Arabian Gulf countries, the health care sectors are enjoying huge investment from both governmental and private sectors. Expensive health care modalities, such as growth hormone are becoming more available and affordable(4).

In this article, an updated review is provided on the management of children with short stature including definition, possible causes, appropriate investigations and current therapy.

Definition

Short stature is the result of impaired bone growth in some period of life including the intrauterine life. Growth is measured by growth velocity. Table 1 (page 46) shows the normal growth velocity in different age groups.

In some conditions, the growth velocity is only diminished early in life, like in cases of small for gestational age (SGA). In other conditions growth velocity is continuously low; an example is children with complete growth hormone deficiency.

Short stature is defined as height below -2.0 standard deviations (SDS) below the mean “2.3 percentile” for age, sex and population(6). Table 2 (page 46) shows the interpretation of growth charts. This definition of short stature is purely statistical; it implies that 2.3% of the normal population is short. The vast majority of these short children have no definable cause (7). The severity of short stature is expressed through the number of SD below the mean. -3 SD below mean is considered severe short stature and only 0.13% of the population lies below this point. The prevalence of organic disease is more prevalent in this subgroup (7).

Idiopathic short stature (ISS) describes the group of patients with short stature who remains after excluding identifiable etiologies (6). The specific criteria required to diagnose Idiopathic short stature is shown in Table 3 (page 46). Idiopathic short stature makes up 60% - 80% of the total cases of short stature (7).

ISS should be subcategorized, principally based on auxological criteria (11). Patients with Idiopathic short stature are subcategorized according to:

i The relationship between the child’s expected final adult height and the mean parental height (MPH):

Age 1 year: (25 cm)	25
Age 1 to 2 years: (10 cm)	10
Age 2 to 3 years: (8 cm)	8
Age 3 to 4 years: (7 cm)	7
Age 4 to 10 years: (4-6 cm)	4-6
Pubertal Acceleration	Girls: (8.5 cm) Boys: (9.5 cm)

Adopted from (5)
Table1: Normal Linear Growth Velocity in children cm/ year

50th centile : the Mean value
97TH centile : 2 SD above the mean
3rd centile : - 2 SD below the mean
97th to the 3rd centile: The normal Height centile position
Height Standard deviation score SDS (HSDS): used for values below the 3rd centile. It is a measure of the deviation of the individual height from the mean height of the population.
Growth velocity as cm/yr

Reference (8)
Table 2: Expression of linear growth

Normal Birth size "not SGA".
Absence of systemic, endocrine or nutritional disease
No psychosocial or environmental deprivation
No detected syndromatic or chromosomal abnormality
Proportionate short stature
Normal growth hormone peak on growth hormone stimulation (>10mg/ml) (10)

Table 3:The criteria are required to make the diagnosis of ISS (9)

- Familial Idiopathic short stature (FSS) - The expected final adult height is close to MPH
- Non-familial Idiopathic short stature (NFSS) - children who are short, even for their parents.
- MPH is calculated by the Tanner method i.e. Mother's Height + Father's Height (+13 for boys and -13 for girls) divided by 2. (12)

ii. Onset of puberty:

- Constitutional Delay of Growth and Puberty (CDGP) is considered when there is delayed onset of puberty.

There is usually positive family history of delayed puberty. When the child presents in early childhood, the onset of puberty is not known. Therefore, the bone age can be used to predict CDGP.

Bone age is used for the prediction of final adult height. Several methods are used; the most common is based on the Greulich and Pyle atlas. Bone age is therefore beneficial for the determination of the etiology of short stature:

- FSS: chronological age equals bone age > height age.
- CDGP: chronological age > bone age, while the bone age is equal to height age.

Significant delay	▪ Constitutional Delay Growth and Puberty. ▪ Secondary growth disorders, e.g. Growth hormone deficiency, Hypothyroidism.
No significant delay	▪ familial Idiopathic short stature ▪ primary growth disorders, e.g. Achondroplasia

Table 4: Interpretation of bone age(13)

Parameter	F.S.S	CDGP
Bone Age	Normal	Delayed > 2 years
Puberty	Normal	Delayed
Growth Rate	Normal	Normal
Family history of delayed puberty	Negative	Positive
Final adult Height	Short	Normal

Table 5: Comparison between Familial short stature (FSS) and constitutional delay of growth and puberty(14)

In cases of familial short stature and constitutional delay of growth and puberty, the yield after extensive investigations is low and the physician may prefer to observe the growth parameters and puberty stage. Growth hormone is less efficacious in these groups.(15)

The evaluation of a short child requires a detailed history and a thorough examination. Table 6 (page 48) lists important elements essential for the approach of a short child.

A short child requires specific investigation to confirm the underlying etiology, and routine investigations to rule out silent causes of short stature. The routine investigations are explained in Table 7.

(See **Baseline Investigations** page 50)

History	Remarks
Country of Origin	Appropriate Growth Chart
Birth Growth Parameters: Weight, Height, Head Circumference and Gestational Age	Small for Gestational Age?
Antenatal: Infection and Drugs	Pituitary or hypothalamic disease
Labor: Breech Delivery and Asphyxia	
Neonatal history: Jaundice and Hypoglycemia	
Past medical history, medication and review of systems	Organic causes of short stature
Nutritional history	Assessment of intake
Development and School Performance	Mental retardation is associated with certain syndromes, chromosomal and metabolic disease
Social History	Effect of short stature on personality and behavior Patient and Family perception of the problem and level of concern Effect of social problems on the child's growth
Family History of Consanguinity, short stature, autoimmune and endocrine disease	Increased likelihood of autosomal recessive disorders
Age of menarche "mother" and age of voice change and growth spurt in father	Constitutional delay of growth and puberty

Table 6: Approach of short stature (continued top of next page)

Growth hormone testing

The indication for growth hormone testing varies from one center to another. Some endocrinologists believe that growth hormone testing should be done to all patients with short stature, together with IG-1 and IGFBP-3 physiological. Others will screen patients through growth velocity, bone age and serum IGF-I and IGFBP-3 levels. If Growth Hormone Deficiency (GHD) is suspected, then GH stimulation is carried out.

Growth hormone tests can be either physiological or pharmacological. Physiological methods include sleep, fasting or exercise. In spite of the high levels of sensitivity, specificity and reliability, physiological tests require considerably more effort to perform, from the physician as well as from the child(16).

Pharmacological Growth hormone testing has major drawbacks. Pharmacological tests are by nature non-physiological, so they may not reflect the true GH secretion pattern. There is marked variability in GH assays. Furthermore, despite different potency for growth hormone stimulation, the cut-off levels are the same for all the tests.

The cutoff for these tests are not defined on large population studies(17). There is a continuum between values in normal people and in cases of severe growth hormone deficiency. All the tests

History	Remarks
Country of Origin	Appropriate Growth Chart
Birth Growth Parameters: Weight, Height, Head Circumference and Gestational Age	Small for Gestational Age?
Antenatal: Infection and Drugs	Pituitary or hypothalamic disease
Labor: Breech Delivery and Asphyxia	
Neonatal history: Jaundice and Hypoglycemia	
Past medical history, medication and review of systems	Organic causes of short stature
Nutritional history	Assessment of intake
Development and School Performance	Mental retardation is associated with certain syndromes, chromosomal and metabolic disease
Social History	Effect of short stature on personality and behavior
	Patient and Family perception of the problem and level of concern
	Effect of social problems on the child's growth
Family History of Consanguinity, short stature, autoimmune and endocrine disease	Increased likelihood of autosomal recessive disorders
Age of menarche "mother" and age of voice change and growth spurt in father	Constitutional delay of growth and puberty

Table 6: Approach of short stature (continued)

have poor reproducibility represented by the fact that there is high percentage of children with an initial GH test indicating GHD and when re-tested they score normal GH levels(18). Therefore, in order to reduce the occurrence of false positive testing, a single negative test result must always be confirmed by another test. Historically, the insulin tolerance test (ITT) has been used in many centers, because it is believed to be a potent stimulus to GH secretion. However, currently it is not recommended to use ITT, due to risks associated with hypoglycemia and its reversal (19).

20 mU/L cut-off level is used to define growth hormone sufficiency. The equivalent of this in ng/ml depends on which International Standard [IS] is used. (equivalent to 10 ng/ml if calibrated against (IS 80/505), and to 6.7 ng/ml if calibrated against the second IS for GH (IS 98/574).

A recent consensus statement from an international collaboration recommended that GH concentrations should be reported in IS 98/574 (20).

Plasma IGF-I and IGFBP-3

IGF-1 and IGFBP-3 are dependent on GH secretion and action. Their levels correlate with spontaneous GH secretion in some studies (21), but less so in others (22) (23). IGF-I is the most GH-dependent parameter within the axis, and is therefore the

Investigation	Disorder of interest
Complete blood count, ESR	Chronic illness
Electrolytes, creatinine, bicarbonate, Bone profile, albumin	Renal insufficiency
TSH, Free T4	Hypothyroidism
Tissue transglutaminase	Celiac disease
IGF-1 and IGFBP-3 levels	Growth hormone axis abnormality
Karyotype abnormalities	Syndromes associated with growth retardation
Bone age	Delay of bone age

Baseline investigations

preferable test to use (24). IGFBP-3 is felt to be less useful, but may have an advantage in very young children, as there is less overlap between normal and GHD children than occurs for IGF-I levels (25). Approximately 25-50% of children with ISS have an IGF-I of less than -2 SDS (26).

Other IGF binding proteins such as ALS or IGFBP-2 do not have an established role in diagnosing GHD. In those found to have very low or undetectable IGF-I levels but only modest short stature, measurement of ALS may be required to identify those children with ALS defects (27).

GH insensitivity

This is a group of both congenital and acquired conditions characterized by normal or supra-normal growth hormone level which has little or no physiological effects. Growth hormone insensitivity should be suspected when having a normal or high GH stimulation result and low or very low IGF-1, or when there is a poor response to an appropriate dose of GH. If the IGF-1 level is normal, GH insensitivity is unlikely(28).

The following two tables present the most common causes of GH insensitivity.

Malnutrition
Liver disease
Catabolic illness
Neutralizing antibodies to growth hormone

Table 7a: Acquired causes

GH receptor defects
GH signal transduction defects (STAT5B mutations)
Primary defects of IGF1 production or action
ALS defect

Table 7b: Genetic causes

A more direct way to assess GH insensitivity is the IGF-I generation test (IGF-GT), involving measurements of serum IGF-I, IGFBP-3 and GH binding protein at baseline and after 4-8 days of GH injections.

Treatment of short stature

Growth hormone
Growth hormone GH is one of the anterior pituitary gland hormones which are secreted by somatotropic cells. GH secretion is mainly nocturnal with intermittent release, occurring especially during REM (rapid eye movement) sleep. Growth hormone release is stimulated by Growth Hormone Releasing Hormone (GHRH) and ghrelin while somatostatin produces the strong inhibitory action. (29)

GH acts at two main sites: the liver and growth plates. In the liver GH stimulates production of IGF-I, IGFBP-3, and acid labile subunit (ALS). GH stimulates the production of IGF-I and proliferation of prechondrocytes at the level of the growth plate.

In 1956 GH was isolated for the first time from human pituitaries. Biochemical structure was established in 1972, but it was until 1985 when Recombinant Human Growth Hormone (rhGH) was produced and administered as used by clinicians.

Indication	Year of Approval
Childhood growth-hormone deficiency	1985 (E)
Chronic kidney disease	1993 (E)
Turner syndrome	1996 (E)
Prader–Willi syndrome	2000 (E)
Small for gestational age	2001 (E)
Idiopathic short stature	2003
SHOX gene haplo-insufficiency	2006 (E)
Noonan syndrome	2007

Adopted from (30)
Table 8: Approved indications for GH use in the USA and Europe (E) in children

Only USA Food and Drug Administration (FDA) approved growth hormone for Children with idiopathic short stature:

· whose height is >2.25 standard deviations (SDs) below the mean
· who have predicted adult heights that are >2 SDs below the mean
· who have open epiphyses
· who have no other condition that would better be treated by other means or by observation.

A successful response to GH treatment in the first year of therapy is defined by a first year height velocity increment more than 3 cm/year, a delta height SDS more than 0.3 to 0.5, or a height velocity SDS more than 1 (7).

While receiving growth hormone, the thyroid hormones, IGF-1 and IGFBP3 levels are monitored. A measurement of FT4 and TSH after 3-6 months and then yearly is helpful to detect subclinical hypothyroidism as GH may increase T4 to T3 conversion and increase thyroid hormone metabolism. IGF-I may be measured at 6-12 month intervals to assure that its levels remain within the normal range for age (31-32). There is no convincing evidence for the routine monitoring of Complete blood counts, lipid profiles, bone markers, and bone age(33).

Measurement of fasting blood sugar and hemoglobin A1C is indicated when impaired carbohydrate tolerance is suspected. The majority of trials assessing the impact of GH on glucose metabolism revealed a slight increase in fasting and post-glucose load insulin levels (34). Most short-term clinical studies did not reveal however, an impaired glucose tolerance or new onset diabetes as a result of GH treatment.

Side effects of GH include Transient intracranial hypertension, slipped femoral capital epiphysis, and gynecomastia. Symptoms of increased intracranial pressure usually occur within the first 8 weeks of therapy and resolve after discontinuing or reducing the dose of GH.

Children receiving GH, who have been treated for malignancy, account for approximately 20% of patients receiving GH therapy. Existing evidence indicates that GH treatment does not increase tumor recurrence in persons successfully treated for their primary lesion (35). Prudence would dictate waiting one year after completion of tumor therapy before initiating GH therapy in this group of children(36).

Children who should be monitored carefully with regard to tumor formation if treated with GH:

· neurofibromatosis type 1
· Down syndrome
· Bloom syndrome
· Fanconi's anemia

IGF-I

Produced by liver and to a lesser extent by the growth plate and bone in serum. The vast majority of the IGF-I is found in the ternary complex, formed by IGF-I, IGFBP-3, and a glycoprotein known as ALS. Less than 1% circulates in the free form. IGFs actions are determined by the availability of free IGFs which interact with IGF receptors.
FDA has approved IGF-1 treatment in children with severe primary IGF-I deficiency and in children with GH gene deletions who have developed neutralizing antibodies to GH.

GnRH analogs

GnRH analogs have been used for suppressing the production of sex steroidal hormones. This slows the process of epiphyseal fusion, giving more time for linear growth and having ultimately greater final adult height. In children with precocious puberty, data shows that the use of GnRH analogues allows children to be taller by delaying their puberty (37) (38). The benefit of this treatment on short children with normal onset puberty is less clear and further studies are required to investigate this area(39).

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Clinical presentation and the outcome of cases with acute intravascular hemolysis caused by primaquine in Yemen

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Abstract

Background: Primaquine is currently the only medication used for radical cure of Plasmodium vivax infection, and as plasmodium gametocyte treatment. Unfortunately, its use is not without risk. Patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency have an increased susceptibility to haemolysis when given primaquine. This potentially fatal clinical syndrome can be avoided if patients are tested for G6PD deficiency and adequately informed before being treated.

Objective: To explore the clinical and paraclinical characteristics of acute intravascular hemolysis caused by primaquine so as to help in prevention, early diagnosis and treatment.

Methods: Analysis of 57 cases of acute intravascular hemolysis caused by primaquine was made and literature review was done. This study was conducted among patients from some areas prevalent with malaria in Yemen.

Results: All patients had the history of administering primaquine, with the symptoms of acute hemolysis; the clinical and paraclinical characteristics of acute intravascular hemolysis were observed: sudden attacks of lumbar and abdominal pain, vomiting, fever, oligo-anuria, temporary consciousness loss, dark urine (black), low hemoglobin, high reticular red blood cell, and jaundice. In our study the Lumbar pain was detected in 55 (96%) patients, Black dark urine 57 patients (100%), Fever 75% (43 patients), Oliguria-anuria 22% (13 patients), General symptoms 100% (57 patients), Pallor (96%) 55 patients, Vomiting 65% (37 patients), Abdominal pain 61% (35 patients), jaundice 88% (50 patients). The Aden province was the leading in the number of patients (26 patients) 46%.

The predominant group was the male gender (40 patients). 34 patients were between 25-35 years old and only 3 patients were more than 35 years old. The vast majority had mild-moderate serum creatinine level while only 8 patients had serum creatinine more than 8 mg%. Regarding hemoglobin Hb level 3 patients had very severe anaemia and none of the patients had normal Hb level. In 43 patients their Hb was moderate-severe. All patients showed serum reduction of LDH and G6PD level. Mild elevation of serum bilirubin was found in 48 of the patients. Hemodialysis was done in 6 patients only while others were treated conservatively. 4 patients died of the underlying acute renal failure due to massive haemolysis. There is a very clear relationship between mortality and low level of Hb, G6PD level, high creatinine.

Conclusion: When sudden attacks of the above symptoms appear, the acute intravascular hemolysis should be taken into consideration first and the giving of the primaquine orally be immediately stopped. Active and proper treatment should be made. Whilst primaquine remains the drug of choice to eradicate hypnozoites and control P. vivax transmission, the risks associated with its use must be minimized during its deployment. In areas where P. vivax exists, patients should be tested for G6PD deficiency and adequately informed before administration of primaquine.

Keywords: acute hemolysis, acute intravascular hemolysis, primaquine, G6PD deficiency

Introduction

Hemolytic anemia after administration of the antimalarial drug primaquine was reported as early as 1926(1). However, it was not until the 1950s that a series of investigations by United States Army researchers identified glucose-6-phosphate dehydrogenase (G6PD) deficiency as the cause of hemolysis after administration of the related antimalarial primaquine(2).

These studies first showed that erythrocytes from subjects who were sensitive to the antimalarial drug primaquine had lower glutathione levels than those who were non-sensitive to primaquine (3) and subsequently that erythrocytes from primaquine-sensitive individuals were unable to maintain glutathione levels after challenge with acetylphenyl/hydrazine(4). In southeast Asia, the prevalence of G6PD deficiency differs greatly by region and ethic group and variants are similarly diverse (5,6,7). For example, in Myanmar, Iwai et al. found prevalence of G6PD deficiency as high as 10.8%. In Thailand, G6PD variants comprised only 68.6%. In India, the population is diverse and the government has tried to map G6PD deficiency more accurately. A recent review summarized G6PD prevalence across the country(8). Prevalence of G6PD deficiency is generally 0-10%, although some communities may have higher prevalence 27.5% (9). In Latin America, the prevalence of G6PD deficiency is generally low (< 2%). In the Middle East, malaria is still present in some areas, including defined regions in Iran, Iraq, Oman, Saudi Arabia, Syria, Turkey, and Yemen. The prevalence of G6PD deficiency has been reported to be 6.1% in Iraqi males (10),11.6% in Iran (11) ,between 3.6% and 8.4% in Saudi Arabian males (12,13,14), 3.0% in Syria (11), 6.9% in Turkey (15)and 6.2% in Yemen (16). Oman has the highest prevalence of G6PD deficiency in the region; 26-29% of Omani males have this disorder(17,18,19).

Glucose-6-phosphate Dehydrogenase (G6PD) deficiency was discovered by Alving and coworkers(1) when they investigated the unusual haemolytic reaction that occurred in ethnic Black individuals following the administration of primaquine, an 8-aminoquinoline, for the radical treatment of malaria. Such “primaquine sensitivity” was later observed in other ethnic groups as well. The use of primaquine is not without its risks. Patients with the inherited sex-linked deficiency of glucose-6-phosphate dehydrogenase (G6PD), have an increased susceptibility to acute intravascular haemolysis when treated with oxidant drugs such as primaquine (6). Exposed patients commonly present with severe abdominal pain, nausea, vomiting and headache. High fevers with rigors can also be seen. The urine becomes almost black and output drops as renal failure ensues. This severe clinical syndrome of intravascular haemolysis, hemoglobinuria and acute renal failure is known as black water fever. This potentially fatal clinical syndrome can be avoided if patients are tested for G6PD deficiency before the administration of primaquine. The most reliable way to detect G6PD deficiency is by DNA analysis, but a diagnosis of G6PD deficiency can also be made by a rapid fluorescent spot test (7). Populations where G6PD deficiency is common, i.e., an incidence of over 1%, are distributed in the Mediterranean regions, across the Middle East, India, Indochina, South China as well as middle Africa. This distribution is similar to that of the thalassaemias and is thought to be due to the selective advantage of these phenotypes against endemic malaria infection in the past. In fact, Luzzatto et al (20) have shown that in the heterozygote G6PD deficient subjects, malaria parasite are preferentially found in G6PD normal red cells.

The majority of the G6PD deficient variants, only manifest when these individuals took drugs or chemicals that trigger the massive haemolysis. Classically, within two days of ingestion of the offending agent, the patient will develop fever, dark brown to black, “Coca-Cola”, urine, jaundice and anaemia. Acute tubular necrosis may complicate such a severe haemolytic episode. The decision for intervention after drug-induced G6PD deficiency-related hemolysis depends on the time course of the reduction in hemoglobin. A rapid decrease in hemoglobin requires that the drug be stopped immediately. Transfusion is clinically guided, and there is no cut-off for hemoglobin to define this decision. Importantly, transfusion may not be possible in remote areas. In general, a severe G6PD-related hemolytic crisis can be treated in a similar fashion to an incompatible blood transfusion (21,20). Some approaches to reduce the severity of G6PD deficiency-related hemolysis have been investigated. Vitamin E has been shown to increase erythrocyte lifespan in G6PD Mediterranean subjects when given for a year. However, there is no evidence that there would be any benefit of administration for acute hemolytic crisis. Desferrioxamine has been used during acute hemolytic crisis and has been claimed to shorten the duration of the crisis and decrease the frequency of blood transfusion needed (21). Early indicators of G6PD deficiency-related hemolysis would be valuable for use in clinical trials both from a safety perspective and as outcomes investigating hemolytic potential. Because the glutathione level decreases before hemolysis starts, this could possibly be used as an early indicator if facilities for detecting this are available. Haptoglobin determinations are not reliable in some populations and reticulocyte formation occurs too late during hemolysis to use as an indicator. Mean hemoglobin concentration and mean hemoglobin concentration of reticulocytes could be used to detect early hemoglobin loss, but this has not been investigated for G6PD deficiency-related hemolysis. Plasma hemoglobin is present at only low concentrations and will not provide meaningful measurements. Heinz bodies (denatured hemoglobin) are present early during hemolysis, but can be difficult to see without considerable experience and this is usually impractical in field conditions.

Similarly, carbon dioxide release would be accurate, but is impractical in the field, although it may be possible in a research setting.

G6PD deficiency: is a combined hemolytic anemia that occurs after administration of primaquine. Cells with G6PD deficiency are sensitive to oxidants such as primaquine. Usually these cells have functional G6PD but the enzyme has a shorter half-life. The consequence is that the hemolytic anemia and reticulocytosis is transient even if primaquine therapy continues - the older RBC are replaced by younger cells with more G6PD. Physical signs of G6PD deficiency anemia include Heinz bodies inside RBC, hemoglobinuria, and jaundice. Normally, G6PD reduces NADP to NADPH. With primaquine (or other oxidative stress), the opposite occurs and NADPH is lost. To compensate, glucose is utilized in the pentose shunt, and NADPH regenerates. No problem. With G6PD deficiency, glucose can't go into the pentose shunt. Primaquine will cause H2O2 and free radicals to build up, and NADPH plummets. Hemoglobin precipitates into Heinz bodies, and RBC are destroyed.

G6PD deficiency screening
The NADPH fluorescence test is a qualitative test and is the gold standard for G6PD deficiency screening(24,25). This test is rapid, reliable, easily performed, and is almost equivalent to a point of care test, taking approximately 15 minutes to perform. It requires only a blood spot on filter paper. Levels < 2.29 UI/g hemoglobin were considered as evidence consistent with G6PD deficiency (23). Effect of G6PD genotype: G6PD variants are classified according to the phenotypic effect:

- class 1, enzyme deficiency with chronic nonspherocytic hemolytic anemia;
- class 2, severe enzyme deficiency (< 10% activity);
- class 3, moderate/mild enzyme deficiency (10-60% activity);
- class 4, very mild or no enzyme deficiency (≥ 60-100% activity);
- class 5, increased enzyme activity.

For example, the common African variant G6PD A- is usually a mild/ moderate deficiency (10-15% of normal activity, hemizygous males) (26,10). In contrast, the G6PD Mediterranean variant is more severe (< 1% of normal activity) (27,10).

Acute Renal Failure: Those with S.cr>1.5 mg% and normal size kidneys on USG were included and divided into 3 groups: mild (Scr< 2 mg%), moderate (Scr 2-5 mg%) and severe (Scr>5 mg%). Dialysis: Renal replacement therapy in the form of haemodialysis was performed if clinically indicated. Early dialysis was considered in the presence of severe acidosis and/or fluid overload. Peritoneal dialysis (PD) was not available. Broadly, those so treated were patients with advanced uraemia, acidosis, hyperkalaemia, fluid overload and rising creatinine with or without oliguria. Double-lumen catheters were inserted into the subclavian, internal jugular.

Objective

To explore the clinical and paraclinical characteristics of acute intravascular hemolysis caused by primaquine, so as to help in prevention, early diagnosis and treatment.

Patients and Methods

It is a retrospective and prospective descriptive and analysis study of primaquine induced intravascular hemolysis IVH during antimalarial therapy.

Study area: The study was carried out at different private clinics and a government central hospital. This center is Al Gamhouria Teaching Hospital Aden, Yemen. It is a retrospective analysis. The patients included were 57 consecutive cases with clinical and paraclinical features of primaquine induced IVH during the period April 2008- April 2010. These patients were on the primaquine therapy given during acute plasmodium falciparum malaria. Details of history and clinical assessments were noted in all. Subsequent follow up was also done by a competent clinician during treatment till discharged or died.

Clinical assessment: Subjects were examined by an experienced general physician before and after treatment. A list of adverse events was examined initially before treatment and used as a baseline for further assessments of the presence or absence of secondary adverse events. These were defined as the expression of any new clinical symptom or sign or the aggravation of an already existing one during the period of treatment. The protocol included qualitative analysis, as recorded by the physician, of 1) the relationship between the event and the treatment, 2) follow-up on the development, 3) the severity, and 4) the outcome. Patients with clinical and paraclinical features of primaquine only induced IVH were included in the study. Details of history and clinical assessments were noted in all. Studied patients all had falciparum plasmodium or their gametocyte on blood smear. The drugs they received were (drug combination) consisted of

(i) sulfadoxine-pyrimethamine 25 mg sulfadoxine plus (1.25 mg/kg as a single dose on the first day)
(ii) artesunate (AS) (4 mg/kg/day for 3 days;), and
(iii) primaquine (0.75 mg/kg as a single dose (30-60mg) on the first or third day of treatment, in conjunction with the first or last dose of AS) (22,23). Those suffering from intravascular hemolysis were selected for further study on the basis of the following criteria:

(i) past personal history of primaquine prescription, and symptomatology
(ii) clinical findings, classically, within two days of ingestion of the offending agent, the patient will develop fever, dark brown to black, "Coca-Cola", urine, jaundice and anaemia. Acute tubular necrosis may complicate such a severe haemolytic episode, especially in those with underlying diseases of the liver such as hepatitis. In those with compromised renal blood flow as evidenced by low urine

output, exchange transfusion to remove the irreversibly damaged red cells that block the microcirculation, can also avert the renal complication. In some patients, disseminated intravascular coagulation (DIC) may complicate, such as massive intravascular haemolysis, and need appropriate treatment.

(iii) paraclinical findings, hematology and biochemistry, sonography of abdomen (kidneys)

(iv) detection of any complication such as acute renal failure. Blood was obtained by pricking finger.

- Complete blood count was performed on a Coulter machine (Coulter Electronics).
- Blood urea, creatinine and electrolytes were all analyzed.
- Liver function tests were performed whether jaundice or not.
- Lactate dehydrogenase (LDH) and reticulocyte count were also requested.
- Glucose-6-phosphatedehydrogenase (G6PD) was indicated.

All the patients were subjected to complete hematological study (hemoglobin, hematocrite, WBC, ESR, and blood film, platelets, retics), routine examination of urine, biochemistry (estimation of blood sugar, renal and liver function tests, G6PD, LDH) and abdominal sonography.

Statistical analysis: Was performed using SPSS for Windows version 18 (SPSS Inc., USA). Continuous variables are reported as mean and standard deviation (S.D.), while categorical variables are shown as count and proportion, chi square (x2) test was used to compare between groups as appropriate. For all tests, two-sided P values were calculated and the results were considered statistically significant if $P<0.05$.

Ethical statement: The study was conducted in accordance with the Helsinki Declaration for the protection of human subjects. Verbal informed consent was obtained from all patients or the guardian (less than 18 years).

		No	%
Age (mean±SD) range	33.5+-17.2(15-50)		
Age (years)	15-<25	23	40.4
	25-<35	31	54.4
	35-50	3	5.2
Residence	Aden	26	46
	Abyan	14	25
	Lahj	10	17
	Others	7	12
Serum creatinine	< 2 mg %	11	19.3
	2-5 mg %	38	66.7
	> 5 mg %	8	14
Total bilirubin	<1 mg	4	7
	1-3 mg	47	82.5
	> 3 mg	6	10.5
G6PD	Severely reduced	18	31.6
	Mil-Moderately reduced	4	7
	Normal /not reduced	35	61.4
Hemoglobin	7-≤ 10 mg %	13	22.8
	4- 7 mg %	41	71.9
	< 4 mg %	3	5.3
Signs and symptoms	Lumbar pain	55	96
	Black dark urine	57	100
	Fever	43	75
	Oliguria-anuria	13	23
	General symptoms	57	100
	Pallor	57	100
	Vomiting	37	65
	Abdominal pain	35	61
	jaundice	50	88
Type of treatment	Conservative	51	**89**
	Dialysis	6	**11**
Outcome	Survive	53	**93**
	Died	4	**7**

Table 1: Shows the Characteristics of the Whole Sample

		Male		Female		Total		P value
		No(40)	%	No (17)	%	No	%	
Age	Mean ±SD							
Age (years)	15-<25	14	35	9	52.9	23	40.4	0.005*
	25-<35	26	65	5	29.4	31	54.4	
	35-50	0	0	3	17.6	3	5.2	
Serum creatinine	< 2 mg %	2	5	9	52.9	11	19.3	0.000*
	2-5 mg %	33	82.5	5	29.4	38	66.7	
	> 5 mg %	5	12.5	3	17.6	8	14	
Total bilirubin	<1 mg	3	7.5	1	5.9	4	7	0.727*
	1-3 mg	32	80	15	88.2	47	82.5	
	> 3 mg	5	12.5	1	5.9	6	10.5	
G6PD level	Severely reduced	13	32.5	5	29.4	18	31.6	0.657
	Mild-Moderately reduced	2	5	2	11.8	4	7	
	Not tested	25	62.5	10	58.8	35	61.4	

*p value (Pearson), not tested= facilities was not available

Table 2: Shows The Characteristics of the Studied Sample according to Gender

		Survive		Died		Total		P value
		No(53)	%	No(4)	%	No	%	
Hemoglobin	7-≤ 10 mg %	12	22.6	1	25	13	22.8	0.000*
	4- 7 mg %	40	75.5	1	25	41	71.9	
	< 4 mg %	1	1.9	2	50	3	5.3	
G6PD	Severely reduced	14	26.4	4	100	18	31.6	0.009*
	Mild-Moderately reduced	4	7.5	0	0	4	7	
	Not tested	35	66	0	0	35	61.4	
Type of treatment	Conservative	49	92.5	2	50	51	89.5	0.051
	Dialysis	4	7.5	2	50	6	10.5	

*significant (p value < 0.05)

Table 3: Shows Some Characteristics of the Studied Sample According to the Outcome

Results and Discussion

Hemolytic reactions during antimalarial therapy have proved to be a limiting factor in the use of 8-aminoquinolines for the cure of vivax malaria. The most severe type of reaction is clinically identical to blackwater fever, and is characterized by massive, explosive, intravascular hemolysis with hemoglobinemia and hemoglobinuria, which constitutes a medical emergency necessitating immediate transfusions. Acute hemolysis has been observed during the therapeutic use of a number of 8-aminoquinolines, for example, pamaquine,(1) pentaquine,(2) and isopentaquine.(3) The incidence of hemolytic reactions is higher in the dark-skinned races. According to Earle and co-workers (37), 5 to 10% of Negroes contract acute hemolysis when given 30 mg or more of pamaquine daily. Only 1% of white subjects studied by them contracted hemolysis which, however, was not acute.

In this study, we observed a statistically significant reduction in Hb concentration in patients after administration of a gametocytocidal drug combination containing primaquine (PQ) and artemisinin (tablets). The observed hemolysis was strongly related to G6PD deficiency. All patients 57(100%) became moderately-severe anemic after administration of the PQ combination. This is potentially important for mass drug administration both as part of attempts to eliminate falciparum malaria and in areas where vivax malaria is predominant, where co-administration with PQ is increasingly likely (28). This study provides evidence for reductions in Hb concentrations after a single dose of PQ, at least in the context of

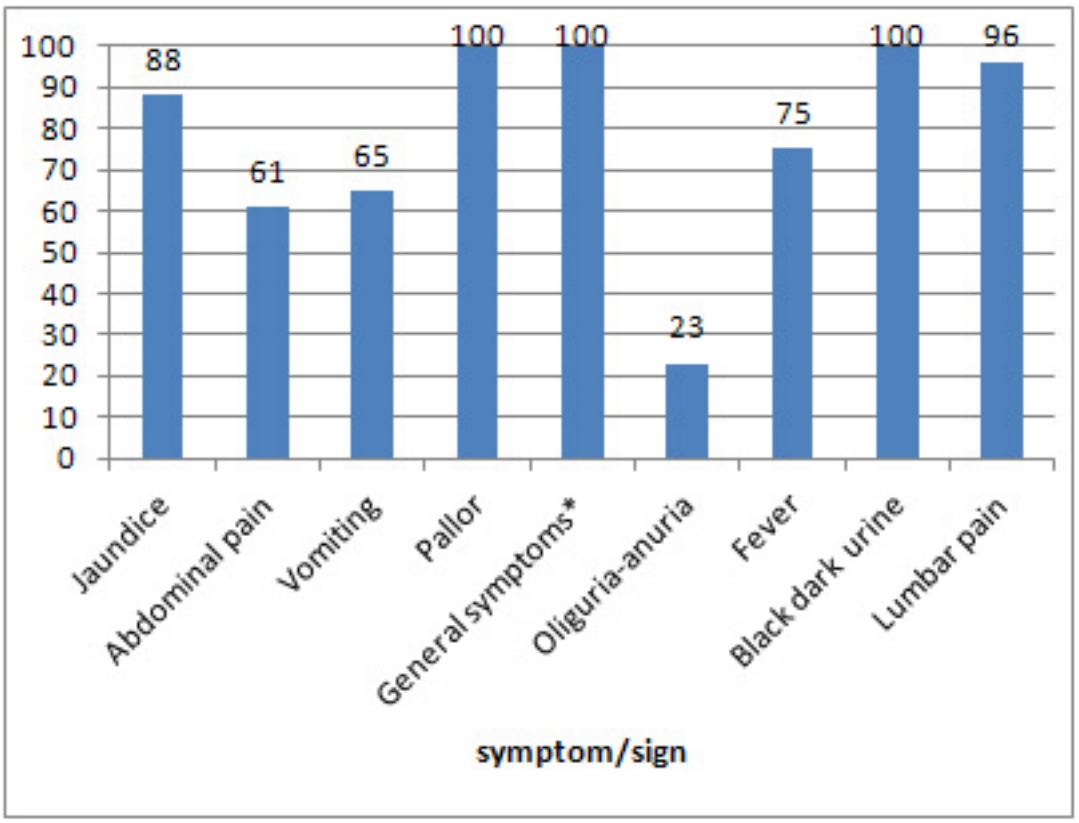

Figure 1: Shows the Presenting Clinical Features in Primaquine Induced-IVH

coadministration with sulphadoxine-pirimethamine +artesunate (SP+AS). The G6PD was reduced in 22 (38.6%) of the study sample population, (29), and because hemolysis in individuals with African-variant G6PD deficiency is generally milder than that in individuals with the Mediterranean variant (30).
All patients had pallor with dark black urine and 13 (23%) patients had oligo- or anuria; jaundice was detected in 50 (90%) patients on presentation. Lumbalgia was present in 55 (96%) patients; these features seen on the presented cases on admission coincided with other international reports.(14,27) About the residence of the study sample, most of the patients (88%) came from Aden governorate and other proximal provinces. This was a logical approach to the unique nephrology and haemodialysis HD center in this area. Regarding sex distribution, there were 40 (70.2 %) males and 17(29.8 %) females with a mean age of 33.5 ±17.2 years (range: 15-50 years). The majority of the patients were younger than 35 years old, more among males than females, so it affects the productivity of these patients with bad economic outcome on the families of those patients and the society.

In contrast to our expectations, we observed considerable and statistically significant reductions in Hb concentrations, and 100% of the patients (57 patients) became moderately to severely anemic after the intervention with SP+AS+PQ. This reduction in Hb appeared frequently (31), and some of the patients needed hospitalization and experienced clinical consequences from the intervention in terms of clinical symptoms of anemia or life-threatening anemia. The asymptomatic nature of hemolysis is in line with previous studies where adult African-Americans with the G6PD developed mild, asymptomatic hemolysis (decrease in Hb of 0.5 to 2.5 g/dl) after weekly administration of 45 mg PQ for 8 weeks (31) and where 8 to 18% of the red cells of G6PD-deficient Thai adults were affected after a single dose of 45 mg PQ (32). The severity of hemolysis was highly variable between individuals and strongly related with G6PD genotype, being most pronounced in homo-/hemizygous (G6PD A?) individuals. Relative overdosing was related to the degree of hemolysis in many patients. This indicates that future studies should base treatment dose on weight.

The current data are not conclusive and are insufficient to lead to public health policy changes. The value of PQ in malaria transmission-reducing strategies depends on the individual risks in relation to the individual and community benefits, which both depend on the transmission setting. Substantial community benefits in terms of a reduction in the burden of malaria may justify side effects even if the immediate individual benefit is limited. Together with a recently published study (29), our data suggest that PQ at the current dosing schedule may not be optimal for wide-scale implementation in combination with artemisinins, even in areas with a relatively low prevalence of G6PD deficiency. Because of the potential role of PQ in combination with artemisinins in malaria elimination efforts (33,34, 53,36), we consider it important to conduct dose-finding studies to define a dosage of PQ that has gametocytocidal properties that are similar to those of PQ at 0.75 mg/kg (29) but is sufficiently low to prevent hemolytic side effects. More than a half (67%) of the patients had creatinine level more than 2 mg%, but more than a half of females had creatinine level less than 2 mg%,

but more than a half of females had creatinine level less than 2 mg%. The hyper-bilirubinaemia of almost all icteric patients was of the-unconjugated variety. Serum G6PD was tested in 22 patients and in all it was reduced.

Millions of people receive primaquine against sexual plasmodia responsible for malaria transmission. These gametocytes cause no symptoms and do not threaten the host, but they infect mosquitoes and threaten the community. Primaquine causes hemolysis in the small minority of patients with glucose-6-phosphate dehydrogenase deficiency (G6PDd). Clinical studies in the 1950s demonstrated gametocytocidal primaquine to be safe without G6PD deficiency screening. Dosage Schedules - Primaquine8-(4-amino-1-methylbutylamino)-6-methoxy quinoline, 30 mg. of base daily, was administered orally in single or divided doses. Disease factors. Acute hemolysis can occur in P. falciparum malaria independent of drug therapy, and appears to be related linearly to the level of parasitemia. It is unknown if there is an interaction between disease-related and G6PD deficiency-related hemolysis. In P. vivax infection, a decrease in the hemoglobin level is almost certainly due to drug-induced hemolysis owing to the low parasite count. Uncommonly, hemolysis may continue after malaria is cured, possibly due to persisting antibodies against erythrocytes, although their role must be considered controversial.

Conclusion and Recommendation

- These patient were selected to study the possible primaquine-induced IVH. 57 patients (100%) presented with black urine and Anaemia. (The most frequent presentation was with black/dark urine and anemia)
- Nearly all patients were from Aden and neighboring provinces in Yemen
- Males predominated and most cases were young and less than 50 years.
- Acute renal failure ARF was seen in 41 (72)%) of patients but oligo-anuric cases were only 13 (23%) patients. Hemodialysis was done in 6 cases
- Clear and prominent correlation between mortality and G6PD deficiency, high blood bilirubin, LDH, serum creatinine, and anaemia.
- Six (10 %) out of 57 patients had a mortal outcome.
- When sudden attacks of the above symptoms appear, the acute intravascular hemolysis should be taken into consideration first and the giving of the primaquine orally be immediately stopped. Active and proper treatment should be made.
- The view of primaquine as a safe gametocytocide thus rests largely upon observations from a G6PD deficiency variant that is unlikely to challenge safety.
- The early clinical work does not seem to afford an adequate assessment of safety in G6PD deficiency patients.
- Potential risk of harm without clinical benefit to the patient raises ethical questions that should be examined.

Conflict of interest:
The author was the Senior Internist and lecturer at Aden medical faculty, Yemen, founder and head of the hemodialysis center Aden governorate, Yemen during the period (since its foundation in 1990 to 2007)

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CME Quiz

Low Back Pain — Case 1

Ernest Mboto, aged 66, farmer. **Problem:** Persistent dull low lumbar back pain for ten weeks, worse at night and steadily becoming more intense.

History of injury:	No
Site and Radiation:	Central lower lumbo-sacral, radiation into both buttocks when severe.
Type of Pain:	Boring deep ache, unrelenting and continuous.
Onset:	Insidious
Aggravation:	Movement and activities such as lifting and gardening.
Relief:	None apart from analgesia.
Associated Features:	Malaise, fatigue, muscular weakness, recent weight loss 2kg.
Urinary symptoms:	Increasing frequency, difficulty starting and stopping micturition.

Physical examination

Inspection:	Gait and movement: Limited with protective movements.
Posture:	Flattened lumbar lordosis.
Palpation:	Mild tenderness to deep palpation over L4 and L5.
Movement:	All movements (flexion, extension and lateral flexion), restricted and protective.
General:	Patient appears unwell. No neurological abnormalities. Examination of chest, CVS, abdomen and urine normal.

What is your provisional diagnosis?
Once you have decided on an answer see opposite page for author's answer

(Case taken from *Low Back Pain*, Professor John Murtagh, © mediworld International)

Answer and Feedback

The provisional diagnosis is spinal metastases from carcinoma of the prostate. The history is typical of metastatic disease with unrelenting pain present day and night. Reduction in all movements is also a characteristic. A rectal examination to assess the nature of the prostate would be important. It was very hard and irregular in this patient.

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