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The Pattern of Feeding in the First 6 Months among Infants in Riyadh .... page 23

## From the Editor

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In this issue a number of authors discussed various topics of interest to the specialty. A cross-sectional descriptive study was aimed at assessing the pattern of feeding in the first 6 months among Saudi infants attending the primary health care centers clinics in Riyadh. All Saudi infants at 6 months old who attended the primary health care centers to receive the vaccination for the 6 month were included. Their results were similar to many studies done in Saudi Arabia. The authors recommend that Health education program carried out by health care providers should be developed and implemented to overcome potential barriers of practicing breastfeeding.

A paper from Jordan looked at PSA as a predictive tool for detecting bone metastases in bone scan. The authors studied 102 patients with prostate adenocarcinoma who were treated in our urology center. They divided their patients into two groups according to their PSA value considering the first one with patients of PSA more than 20ng/ml and the second group with PSA of less than or equal to 20ng/ml. the results were 82.7% of patients with PSA more than 20ng/ml to have positive scan with bone metastases and 82% of patients with PSA less than or equal to 20ng/ml to have negative scan. The authors concluded that PSA can be considered as a good tool for the prediction of bone metastases in patient with prostate cancer especially for patients with a PSA value of 20 ng/ml and more, and as an accepted tool when the PSA value is 10-20 ng/ml.

A Randomized controlled Clinical trial attempted to verify the role of H pylori in pathogenesis of HG, and whether treatment will improve patients symptoms. 46 pregnant ladies in their first pregnancy were included in this study, all complaining of hyperemesis gravidarum and positive immunoglobulin G ( IgG) for H pylori. The patients were divided into two groups: 1st group (control group 22 patients): who received traditional treatment for HG (intravenous fluid, antiemetic's drugs, and ant motility drugs, multivitamins) 2nd group (study group 24 patients): who received treatment for H pylori (metronidazole 500mg twice daily +amoxicillin 1 gram twice daily+omeprazole 20mg twice daily). The authors concluded that significant improvement of the symptoms of HG in pregnant lady with positive IgG for H pylori when received treatment for eradication for H pylori.

A case report from Turkey looked at the operative records for two patients undergoing EPL reconstruction. The two patients had exposure to local steroids but this exposure was not into the ruptured tendon. It is administered about 2 cm away from the tendon. They identified 2 patients who presented with spontaneous EPL tendon rupture owing to steroid injection. These patients reported no risk factors or inciting event other than steroid injection. EPL was operatively repaired in two cases. At the 2-year follow-up, patients could completely extend the thumb. The cases were from Eastern Mediterranean region of Turkey. The authors concluded that in patients with unexpected loss of extension of the thumb interphalangeal joint, with a history of steroid injection, rupture of EPL tendon should be considered even if it was administered to remote location.

A paper from Lebanon looked at Wernicke's encephalopathy which is a well-known neurological complication of vitamin B1 deficiency that can occur following intractable vomiting secondary to different malabsorption conditions, alcoholism and hyperemesis gravidarum. The

author reported a 22-year-old female who presented for vertigo, truncal ataxia and multidirectional nystagmus in all directions of the gaze movement following several weeks of intractable vomiting, 2.5 months after a Roux-en-Y gastric bypass surgery and an unrevealed pregnancy. Because of several exposures to radiation while performing multiple X-rays and CT scans of the abdomen and pelvis, the patient was recommended to undergo dilatation and curettage procedure. Results: She was diagnosed with vitamin B1 deficiency secondary to hyperemesis gravidarum status and malabsorption syndrome following a gastric bypass. The diagnosis was confirmed by the drastic clinical improvement on replacement therapy with intravenous vitamin B1 before we obtained the blood vitamin B1 level which came back low. Conclusion: Replacement with vitamin B1 should always be started as soon as the clinical suspicion of Wernicke's encephalopathy is raised to prevent the occurrence of permanent complications.

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# PSA as a predictive tool for detecting bone metastases in bone scan

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## Introduction

Prostate cancer is now considered as the fourth most common male malignant neoplasm worldwide with the lowest yearly incidence rates occurring in Asia and the highest in Scandinavia and North America, especially in African Americans. Mortality also varies widely among countries, being highest in Sweden and lowest in Asia. It is considered as the cancer of the elderly age group with a peak incidence between 70 and 74 years. (1)

Prostate-specific antigen (PSA) since its application in the late 1980s through to the 1990s as a tumor marker for prostate cancer has made a revolution in the early detection, prognosis and follow up of prostate cancer disease. During the PSA era, identification of organ confined prostate cancers has improved treatment outcome and curability with either radical prostatectomy or radiation therapy. (1, 2)

Advanced prostate cancers tend to give skeletal bone metastases which will lead to bone pain, pathological fractures and spinal cord compression. Bubendorf L et al in their autopsy study found that as many as 80% of advanced prostate cancer is accompanied by bone metastases. (3) Staging of prostate cancer patients include a variety of imaging modalities of which Radionuclide bone scan (bone scintigraphy) is the most sensitive and also the most expensive modality for the evaluation and detection of skeletal bone metastases.

The aim of our study in patients with prostate cancer is the evaluation of the relationship between serum concentration of PSA and bone metastases in bone scintigraphy.

## Abstract

**Introduction:** PSA is considered as a tumor marker for prostate cancer which has helped since its first application in the early detection, prognosis and follow up of patients with prostate cancer. In our study we collect the results of bone scans of patients with prostate cancer and correlate them with their serum PSA value to predict the efficacy of PSA value in predicting bone metastases.

**Material and methods:** Our study was in 102 patients with prostate adenocarcinoma who were treated in our urology center and sent for staging in the nuclear medicine Lab for bone isotope scan for the detection of bone metastases in addition to the collection of their PSA value and the comparison between scan results and PSA value.

**Results:** We divided our patients into two groups according to their PSA value considering the first one with patients of PSA

more than 20ng/ml and the second group with PSA of less than or equal to 20ng/ml. The results were 82.7% of patients with PSA more than 20ng/ml to have a positive scan with bone metastases and 82% of patients with PSA less than or equal to 20ng/ml to have a negative scan.

**Conclusion:** PSA can be considered as a good tool for the prediction of bone metastases in patients with prostate cancer especially for patients with a PSA value of 20 ng/ml and more, and as an accepted tool when the PSA value is 10-20 ng/ml.

**Key words:** PSA, bone metastases

## Material and Methods

Our study was carried out from January 2010 to December 2011 in cooperation between Prince Hussein Urology center and nuclear medicine lab at King Hussein medical center where 102 patients with prostate adenocarcinoma were treated.

Patients' age was in the range between 44-85 year old with one patient 44years old, three patients in the range of 50-60 years, forty seven patients between 60-70 years old and the remaining fifty one patients more than 70 years old.

All patients presented to our urology center with lower urinary tract symptoms and were investigated with digital rectal examination, complete blood count (CBC), PT (prothrombin

time)/ PTT( partial thromboplastin time) (blood coagulation profile), serum creatinine and electrolytes, urinary analysis and culture, renal and pelvic ultrasonography and serum PSA with a normal PSA value of 0-4 ng/mL.

All patients were diagnosed as prostate adenocarcinoma either by transrectal ultrasonographic prostate biopsy for an elevated serum PSA or palpable prostatic nodules on digital rectal examination, or in tissue biopsy post transurethral resection of prostate for benign prostate hyperplasia.

After the diagnosis of prostate adenocarcinoma patients were sent for bone scintigraphy in the Nuclear medicine lab where patients

received 700 MBq 99 mTc-methylene diphosphonate intravenously and whole body images were obtained 3 hours later.

Serum PSA value for our patients was in the range between 0-500,000 ng/mL and as patients with prostate adenocarcinoma and a PSA level of less than ten is considered of low potential for bone metastases we considered the value of ten as a reference value.

Bone scintigraphy was considered positive if any bony metastases were detected and negative if no bone metastases were identified and the results of bone scan were put in comparison with the PSA results in order to obtain a conclusion of our study.

## Results

In order to obtain a good comparison we divided our patients into two groups:

**Group A:** patients with prostate adenocarcinoma and a PSA value of more than 10.

**Group B:** patients with prostate adenocarcinoma and a PSA value of less than or equal to 10.

Bone scan results were considered positive for reported bone metastases and negative for normal scan, degenerative bone changes and old bone trauma.

Group A patients were 75 patients with a positive scan in 46 (61.3%) patients and a negative scan in 29 (38.7%) patients as shown in Table 1.

**Table 1: Group A results**

	Positive scan	Negative scan	Total
Group A	46	29	75
Percentage	61.3%	38.7%	100%

Group B patients were 27 patients with a positive scan in only 6 (22.2%) patients and a negative scan in the remaining 21 (77.8%) patients as shown in Table 2.

**Table 2: Group B results**

	Positive scan	Negative scan	Total
Group B	6	21	27
Percentage	22.2%	77.8%	100%

In Table 3 we join the two groups with the percentage from the sum of the patients.

**Table 3: The results of bone scan according to PSA value**

Group	Positive scan	Negative scan	Total
Group A	46 45.1%	29 28.4%	75 73.5%
Group B	6 5.85%	21 20.65%	27 26.5%
Total	52 50.95%	50 49.05%	102 100%

In order to widen the range of our study we also divided our patients into another two groups using PSA value of 20 ng/mL as a reference value as follows:

Group AA: patients with a PSA of more than 20. Group BB: patients with a PSA of less or equal to 20.

According to our new classification group AA patients were 52 patients with 43 patients with a positive scan and only 9 patients with a negative scan as shown in Table 4. Group BB patients were 50 patients with 9 patients with a positive scan and 41 with a negative scan as shown in Table 5.

**Table 4: Group AA results**

	Positive scan	Negative scan	Total
Group AA	43	9	52
Percentage	82.7%	17.3%	100%

**Table 5: Group BB results**

	Positive scan	Negative scan	Total
Group BB	9	41	50
Percentage	18%	82%	100%

Table 6 shows the results of both groups with the percentage from the sum of patients.

**Table 6: The result of bone scan according to PSA value with reference value of 20 ng/mL**

Group	Positive scan	Negative scan	Total
Group AA	43 42.15%	9 8.55%	52 50.7%
Group BB	9 8.8%	41 40.5%	50 49.3%
Total	52 50.95%	50 49.05%	102 100%

According to the results shown in the previous tables we noticed that serum PSA can be considered as an acceptable tool for the prediction of bone metastases in the group of patients with PSA reference value of 10 ng/mL, but as a good tool in the group of patients with a PSA reference value of 20 ng/mL.

## Discussion

With increased screening for and earlier detection of prostate cancer, the proportion of men needing additional investigations will probably increase. Since the advent of PSA testing, several authors have shown that the PSA level correlates with the relative risk of bone metastases(5,10,11).

Although there are numerous reports addressing bone scan findings in relation to PSA level, in only a few has the serum ALP level also been assessed. ALP is particularly valuable in identifying the subgroup of patients whose metastatic disease relapses while on hormonal treatment, despite a negligible increase in PSA.

In patients with prostate cancer the detection of bone metastases is important for selecting the most appropriate therapy. Because bone scintigraphy is the most sensitive method in clinical practice of detecting these metastases (12,15), it is used frequently at the time of diagnosis. The cost-effectiveness of carrying out routine bone scans only in men with a PSA level of > 10 ng/mL has been shown by Oesterling et al.(6,16). Of 2064 consecutive patients with newly diagnosed untreated prostate cancer and a serum PSA level of <20 ng/mL, seven had positive results on their bone scan, four of whom had a serum PSA of > 10 ng/mL and five had skeletal pain. Of these seven patients with positive bone scans, only one had a PSA of < 10 ng/mL. At a threshold of 10 ng/mL the observed false-negative rate was 0.5%. Both Chybowski et al.(5) and Oesterling et al.(16) concluded that a staging bone scan is unnecessary in patients with newly diagnosed previously untreated prostate cancer, a serum PSA level of 10 ng/mL and no skeletal symptoms. Recent reports discourage the routine use of a bone scan when the serum PSA level is <10 ng/mL, because this level is a strong negative predictor of a positive bone scan (17). Many clinicians now limit bone scans to men with a preoperative PSA level of > 20 ng/mL and/or bony symptoms, provided

the Gleason score is <7 (G1 or G2 tumours) (5,6,16). This obviously has significant cost-saving implications.

Because it has high sensitivity and a confirmed correlation with tumour burden, various authors attempted to correlate serum PSA concentrations with bone scan findings (5,16,18-21), although these results could not be confirmed in a recent report (22). The serum PSA concentration provided little information about the presence of bone metastasis and it was doubtful whether a staging radionuclide bone scan could be omitted in patients with a serum PSA value of <10 ng/mL (22).

In the present study the PSA level was < 20 ng/mL in 19 (17%) of 111 patients with a positive bone scan (representing metastatic disease). This incidence of bony metastases at this PSA level is higher than previously reported, because there was a high proportion of patients with moderate and poorly differentiated disease.

## Conclusion

PSA can be considered as a good tool for the prediction of bone metastases in patient with prostate cancer especially for patients with a PSA value of 20 ng/ml and more, and as an acceptable tool when the PSA value is 10-20 ng/ml.

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# Early Child Marriage in Mosul at North of Iraq: Prevalence and Preference

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## Abstract

**Background:** Child marriage occurs when one or both of the spouses are below the age of 18. It is defined as health and social problem. Girls who are married at early ages are more likely to drop-out of school, experience higher levels of fertility and maternal mortality.

**Aim:** The present study aimed at estimating the prevalence of child marriage in Mosul in the North of Iraq and determining the associated socio-cultural factors; as well as at finding out preference of such behavior among study sample.

**Subjects and Methods:** The study adopted a cross-sectional design and followed a multi-stage stratified sampling method, by which, twenty primary health care centers were conveniently selected to interview 1302 married women in child-bearing age having at least

two living children. The study was carried out over approximately ten months' duration. Statistics were applied to estimate the prevalence of early child marriage, and to examine the association of some socio-demographic and cultural factors with the estimated prevalence.

**Results:** The prevalence of early child marriage was 15.7%. It was almost equally distributed within both Muslims and Christians. Higher prevalence was significantly associated with urbanization ( $p=0.008$ ), consanguineous marriage ( $p=0.000$ ), early marriage of men ( $p=0.006$ ) and low level of couples' education ( $p=0.000$ ). What's more, early child marriage was preferred by 7.1% of studied subjects.

**Conclusions:** In Mosul the actual prevalence of early child marriage was as twice as the preference.

It seems to be a product of various socio-cultural factors particularly couples' illiteracy and consanguinity.

**Recommendations:** All efforts are needed to encourage school-attendance of all children without gender discrimination. Besides, risks of child marriage should be incorporated within the process of health education.

**Key words:** prevalence, preference, children, marriage, Mosul, Iraq

## Introduction

Child marriage occurs when one or both of the spouses are below the age of 18. Child marriage persists, especially in poor and rural parts of countries in the developing world. Despite near-universal commitments to end child marriage, one in three girls in developing countries (excluding China) will probably be married before they are 18 and one out of nine girls will be married before their 15th birthday. Most of these girls are poor, less-educated, and living in rural areas. While child marriages are declining among girls under age 15, 50 million girls could still be at risk of being married before their 15th birthday in this decade (1). It more commonly affects girls than boys.

Maternal age is on the top of the list of risk variables affecting pregnancy outcomes and prevalence of maternal morbidity and mortality. Pregnant teenagers face many of the same obstetric issues as women in their 20s and 30s plus additional medical concerns for mothers aged 14 years or younger, especially if they live in a developing country, such as several types of nutritional deficiencies and anemia(2). Women who are married at early ages are more likely to drop-out of school, experience higher levels of fertility and maternal mortality(3). In addition to lower educational levels, teenage pregnancies are associated with many other social issues such as higher rates of poverty, and poorer "life outcomes" in children of teenage mothers(2-4). Even if family planning services are available, married young girls may lack the power to use them. Young wives often have limited autonomy or freedom of movement. They may be unable to obtain health care because of distance, expense or the need for permission from a spouse or in-laws. Beside, isolation and powerlessness pose additional reproductive health risks. These barriers can collectively aggravate the risks of maternal mortality and morbidity for young pregnant women(5).

Report of UNICEF in 2008 stated that about 5-6 million infant deaths and 200,000 maternal deaths every

year in developing countries could be avoided if women choose to have their children within the safest of reproductive years in addition to adequate spacing between births(6).

The present study aimed at estimating the prevalence of early child marriage in Mosul at the North of Iraq and determining the associated socio-cultural factors.

## Subjects and Methods

To achieve the aim of the present study, a health institutions cross-sectional design was adopted. To begin with, administrative and ethical agreements were obtained from Nineveh Health Directorate in Mosul. Daniel's (7) equation [ $n = [(Z(1-\alpha)^2 pq/d^2) \times 2] + 5\%$ ] was used to estimate the required sample size with 95% confidence interval and 0.03 width. Where:  $n$  is the estimated sample size,  $\alpha$  is type one error=0.05, so the corresponding Z-value was 1.96(8);  $p$  is the proportion of married women in child bearing age (15-49 years old) which is 14% according to the report of the Department of Primary Health Care in Nineveh Health Directorate in 2012(9),  $q$  is  $(1-p) = 0.86$ ,  $d$  is the desired level of precision= 0.03 and 2 is the design effect that is mostly taken i.e. as twice as studied size (10). Finally 5% is considered as a contingency error such as non-response or recording error(11).

The study followed a multi-stage stratified sampling method. First stage was the geographical division of Mosul vertically by Tigris River and horizontally by Nineveh Street and its extension into four geographical areas: North East, North West, South East and South West. Subsequently, each area was stratified into three social strata (urban, suburban and rural) according to their closeness to downtown. The third stage was non-random selection of twenty primary health care centers (PHCCs) depending on population size and proportion of women in child bearing age in each catchment area. The inclusion criteria were "mothers who are currently married, in child-bearing age having at least two living children and who attend one of the included PHCCs". Eligible mothers

were selected on a consecutive base after obtaining verbal consents from them. Distribution of the estimated sample was weighted according to population size and proportion of married women in child-bearing age in each catchment area.

The required data were collected by filling out a special questionnaire form that was structured for this purpose. It encompassed closed and open ended questions. Its validity was assessed as 83.8%. In addition, a pilot study was conducted to assess the reliability of the form and to estimate time needed for completing data collection. Both intra- and inter-observers variations were estimated as 86.8% and 82.9% respectively that made the questionnaire's reliability 87.2%. The questionnaire included socio-demographic characteristics of the studied sample, and their actual and preferred age at marriage. The required data needed almost ten months duration (from April, 1st 2011 till the end of Jan, 2012) to be collected. Work schedule was organized to visit each geographical area once every fourth week. The first area was selected randomly and the remaining was arranged systematically in a clock-wise direction.

The present study estimated the prevalence of both actual and preferred age at marriage and the association in-between was assessed by Pearson's correlation test ( $r$ ). The significance of the association of some socio-demographic and cultural factors with the estimated prevalence was examined by  $\chi^2$ -test; while, estimation of such association was appraised by odds ratio (OR) calculation. Significance was judged through the value of calculated  $p$  ( $p$ -value  $\leq 0.05$ )(7).

## Results

The interviewed mothers were either from urban (52.4%) or suburban or rural regions (47.6%). Most of them (93.9%) were Muslims and the rest were Christians; no Yazidis were reported. Arabs constituted 83.7% of the studied sample; while Kurds,

Turkmen and Shabaks formed 7.3%, 4.8% and 4.1% respectively. Two thirds of mothers (65.4%) reported consanguineous marriage and 54.3% lived in an extended family structure.

The mean age of the selected sample was  $30.0 \pm 7.7$  years. The majority (80.3%) were 20-39 years old; less than 20 formed 7.4% and the rest (12.3%) were at the end of their fertility span (40-49 years old). The mean age of the considered husbands was  $36.0 \pm 9.3$  years with a range of 17-81 years; just 0.8% of them were less than 20 and 23.7% were in their second decade, the remaining 41.4% and 34.1% were in their thirties and older respectively. Illiteracy was found among 48.8% of mothers and 29.3% of the concerned husbands.

**Table 1: Actual age at marriage and first pregnancy of the studied mothers by area of residence**

Age (years)	Urban (n=682)		Suburban & rural (n=620)		Total (N=1302)		p-value
	No.	%	No.	%	No.	%	
<b>Maternal age at marriage</b>							
< 15	117	57.4	87	42.6	204	15.7	0.256
15-19	306	50.0	306	50.0	612	47.0	
20-29	244	52.9	217	47.1	461	35.4	
$\geq 30$	15	60.0	10	40.0	25	1.9	
<b>Maternal age at first live birth</b>							
< 15	88	56.1	69	43.9	157	12.1	0.625
15-19	303	47.6	275	52.4	578	41.6	
20-29	274	50.9	264	49.1	538	41.3	
$\geq 30$	17	58.6	12	42.4	29	2.2	

Table 1 presents the actual maternal age at marriage and starting reproduction. Maternal age at marriage ranged between 11-38 years with a mean of  $18.5 \pm 4.2$  years. Child marriage was reported among 62.7% of mothers. The prevalence of early child marriage i.e. before completing 15 years was 15.7%. The same table shows that more than half (53.7%) had their first live born while they were before the age of 20; adding to that 12.1% of them were still children i.e. not passing their 15th birthday when they had their first live born. No significant differences were detected between studied localities. In the meantime, 7.1% of interviewed mothers preferred early child marriage and 29.9% preferred marriage of girls before the age of twenty, without significant differences as well, (Table 2).

**Table 2: Preferred age at marriage as stated by studied mothers**

Preferred age at marriage (years)	No.	%
< 15	92	7.1
15-19	520	29.9
20-24	669	51.4
$\geq 25$	21	1.6
Total	1302	100.0

What is more, the present study confirmed that maternal age of starting reproduction i.e. at first pregnancy was significantly and positively correlated with maternal age at marriage ( $r=0.9$ ,  $p=0.000$ ), (Figure 1 - next page).

Figure 1: Correlation between maternal age at marriage and age at first pregnancy

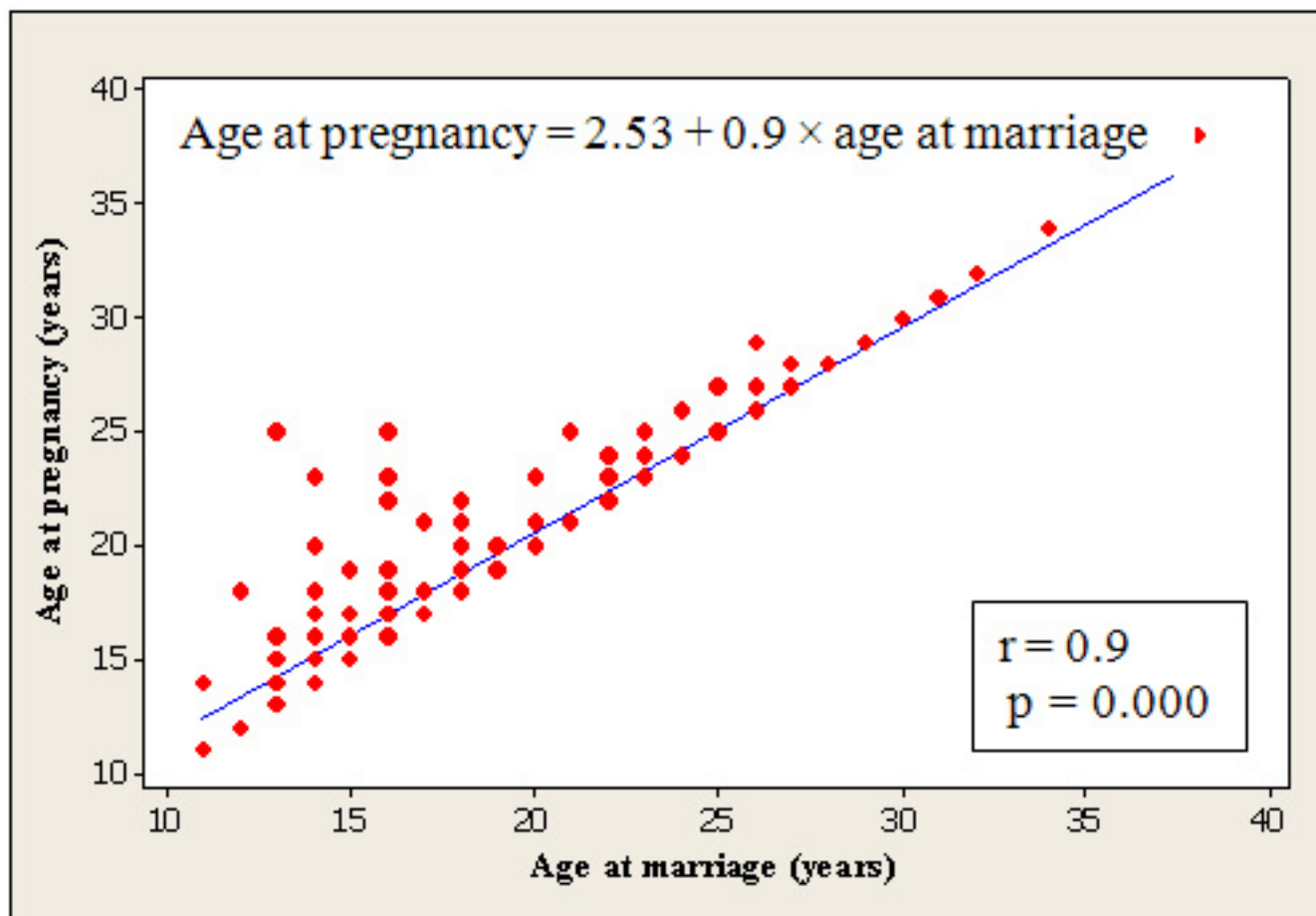


Table 3 demonstrates that early child marriage was reported within both religions (Islam and Christianity). Higher prevalence (16.1%) was recorded among Arab mothers (OR=4.7, 95%CI=3.0-7.4,  $p=0.000$ ) in comparison with the Kurds where the prevalence was 11.6% (OR=0.5, 95%CI=0.2-0.9,  $p=0.03$ ). Moreover, the prevalence of early child marriage was significantly two times more common in urbanized families (OR=1.8, 95% CI=1.1-3.0,  $p=0.008$ ). No early child marriage was reported among the 1st or 2nd social class-families; while it was found among other social classes without significant difference. Early child marriage was significantly less common (13.9%) among families having nuclear structure (OR=0.7, 95%CI=0.5-0.9,  $p=0.02$ ). Adding up, consanguineous marriage significantly doubled the possibility of early child marriage (OR=1.9, 95%CI=1.3-2.7,  $p=0.000$ ).

Table 4 (page 14) describes the association of early child marriage with personal characteristics of spouses. No case of early child marriage was recorded among mothers with 12-years education or higher. Meanwhile, the prevalence of alike marriages was almost two times more frequent in housewives than workers mothers (16.0% versus 12.1%) in a significant mode (OR=2.3, 95%CI=1.2-4.7,  $p=0.006$ ).

Early marriage of men i.e. before the age of 25 greatly increased the prevalence of women's early child marriage to 23.3% (OR=83.9, 95%CI=39.4-189.6,  $p=0.000$ ). In addition, husbands' education below 12-years of schooling was associated with five fold augmentation of the prevalence of this practice (OR=5.2, 95%CI=2.9-9.5,  $p=0.000$ ).

**Table 3: Association of child's marriage with socio-demographic and structural features of studied families\*****A: Association of child's marriage with socio-demographic features**

Socio-demographic features	Actual age at marriage*				Total (N=1302)	OR (95% CI)	p-value
	< 15 years (n=204)		≥ 20 years (n=486)				
	No.	%	No.	%			
<b>Religion</b>							
Muslim	192	15.7	454	37.1	1223	1.1 (0.5-2.4)	0.7
Christian	12	15.2	32	40.5	79		
<b>Ethnicity</b>							
Arab	176	16.1	379	34.8	1090	4.7 (3.0-7.4)	0.000
Kurd	11	11.6	51	53.7	95	0.5 (0.2-0.9)	0.03
Turkmen	5	7.9	28	44.4	63	0.4 (0.1-1.1)	0.06
Shabak	12	22.2	28	53.7	54	1.0 (0.5-2.1)	0.9
<b>Residence</b>							
Urban	117	17.2	259	38.0	682	1.2 (0.8-1.7)	0.3
Rural & suburban	87	14.0	227	36.6	620		
<b>Urbanization</b>							
Present	37	19.0	52	26.7	195	1.8 (1.1-3.0)	0.008
Absent	167	15.0	433	39.1	1107		
<b>Social class</b>							
1 <sup>st</sup> and 2 <sup>nd</sup> classes*	--		27	56.3	48	--	
3 <sup>rd</sup> class	84	13.4	218	34.7	628	0.7 (0.6-1.2)	0.4
4 <sup>th</sup> and 5 <sup>th</sup> classes	89	14.2	179	34.8	514	1.3 (0.9-1.9)	0.09
Unemployed	21	18.8	62	55.4	112	0.8 (0.4-1.4)	0.4

\* Mothers who got married at (15-19) years of age were excluded from the statistical analysis.

**B: Association of child marriage with families' structural features**

Structural features	Actual age at marriage*				Total (N=1302)	OR (95% CI)	p-value
	< 15 years (n=204)		≥ 20 years (n=486)				
	No.	%	No.	%			
<b>Family structure</b>							
Nuclear	75	13.9	223	41.2	541	0.7 (0.5-0.9)	0.02
Extended	129	49.0	263	34.6	761		
<b>Consanguineous marriage</b>							
Present	143	16.8	268	79.9	852	1.9 (1.3-2.7)	0.000
Absent	61	13.6	218	48.4	450		
<b>Polygamy</b>							
Present	22	23.2	49	51.6	95	1.0 (0.6-1.9)	0.8
Absent	182	15.1	437	36.2	1207		

\* Mothers who got married at (15-19) years of age were excluded from the statistical analysis.

**Table 4: Association of child marriage with personal characteristics of the spouses\***

Personal characteristics	Actual age at marriage*		Total N=1302	OR (95% CI)	P-value
	< 15 years (n=204)	≥ 20 years (n=486)			
	No. (%)	No. (%)			
<b>Maternal education (in years of schooling)</b>					
< 12	204 (100.0)	425 (34.9)	1219	-	
≥ 12	-	61 (73.5)	83		
<b>Maternal occupation</b>					
Housewives	192 (16.0)	423 (35.2)	1203	2.3 (1.2-4.7)	0.006
Working	12 (12.1)	63 (63.6)	99		
<b>Paternal age at marriage (in years)</b>					
< 25	125 (23.3)	9 (16.8)	537	83.9 (39.4- 189.6)	0.000
≥ 25	79 (10.3)	477 (62.4)	765		
<b>Paternal education (in years of schooling)</b>					
< 12	189 (18.1)	344 (32.9)	1045	5.2 (2.9-9.5)	0.000
≥ 12	15 (5.8)	142 (55.3)	257		

\* Mothers who got married at (15-19) years of age were excluded from the statistical analysis.

## Discussion

It is worthy to recognize that Iraq is among many areas in the Middle East and North Africa (MENA) region that had legislated eighteen years as the minimum age for females' marriage(12). Any marriage in which a girl is younger than legal age is termed "early marriage". Before such age, the girl is either physically, physiologically or psychologically ill-prepared to take on the responsibilities of marriage and childbearing(13). The Iraqi legislation limits marriage after completing eighteen years old in order to ensure attainment of physical and mental fitness as much as possible. It allows some petitions of those completing fifteen years old who request marriage only in condition that their guardians had recommended their suitability(12). However, early marriage, as found in the present study, remains the norm as many young girls are expected to marry in the second decade of their lives with formal registration, and under civil, religious or customary laws.

Recently, according to the preliminary report of the Multiple Indicator Cluster Survey in Iraq (MICS-4)(14) which was conducted in 2012, about one in five young women aged 15-19 years (19%) is currently married. This proportion does not show a discrepancy between urban (18%)

and rural areas (19%), but is strongly related to the mother's education. The same survey reported as well that 6% of women aged 15-49 years were married before the age of 15 years, while 20% of women aged 20-49 years were married before the age 18 years.

Two decades ago, Al-Kandaly(15) in 1989 interviewed primigravida women who attended the two Maternity Hospitals in Mosul for delivery at that time. She found that the mean age at marriage was 19.4 years and ranged between 12-36 years and mean maternal age at first pregnancy was 27.4 years and ranged between 14-45 years age. She added that 14.3% of her sample was not completing twenty years old and one tenth of such mothers (10.7%) got married before completing 15 years.

The estimated variation between Al-Kandaly's(15) and the present study i.e. duplication of proportion of teenage first pregnancy with declining both upper and lower limits of age-range may be attributed to war, social problems and insecurity that Iraq witnessed during the preceding decades. It has been reported in 2011 that approximately 40% of Palestinian women had their first birth at the age of 18 or less, 66.4% had their first birth before

they turned 20 and only 7% of ever-married women had their first birth at the age of 25 and above(16). The main reason for early marriage in Palestine as stated by World Bank, MENA and Social and Development Group(17) in 2009 is the war since families wish to increase the generations to help them face life hardship in the region as well as to assure girls' security.

Later on Rashed et al.(18) from Population Reference Bureau stated that the trend of early marriage and early motherhood is decreasing in many Arab countries throughout the last decades and the average age at marriage for both men and women is generally rising. Such trend is part of a general global phenomenon introducing new issues into the Arab societies that would confront deeply rooted cultural values and raise legal and policy challenges. The same reference revealed that according to the Demographic and Health Surveys (DHS) in Arab regions, the most notable decline of maternal age at marriage was witnessed in Kuwait, Libya, and the United Arab Emirates. In the early 1970s, around 40% of women aged 15 to 19 were married in Kuwait and Libya, but these figures dropped by the mid-1990s to 5% and 1%, respectively. The pace of decline has been even faster in the United Arab Emirates, where the proportion

of women's ages 15 to 19 who were married dropped from 57% in 1975 to 8% by 1995. In Tunisia, Algeria, and Lebanon, only 1% to 4% of women aged 15 to 19 is married. In addition, the highest rates of teenage pregnancy in the region are found among Mauritanian, Yemeni and Palestinian mothers, where one in every 10 women aged 15 to 19 gives birth every year.

In Jordan, the legal age of females' marriage is 18 years. But, the chief justice could lower it to 15 years in cases where early marriage is deemed to be in the best interest of the young bride and groom. Data of Jordanian DHS in 2007 showed that 5.7% of girls aged 15 to 19 were married, divorced or widowed at the time of data collection(19).

In Egypt, where the legal age for females' marriage is 16 years, DHS in 2005 showed that the mean age at first marriage among ever married women (15-49) reached 19.5 years. It is higher in urban than in rural (20.8 years versus 18.6 years) respectively. It also increases as the socioeconomic status of the household increases. In urban areas, it raised from 18.7 years to 22.7 among the lowest and the highest socioeconomic levels(20).

The clear disparity of teenage marriage prevalence between the findings of the present study and what had been reported in the MENA region may be explained by the dissimilarity of research techniques. Data of the UN is usually derived from official archives and international statistics. Meanwhile, many families arrange for their daughters to marry in religious wedding ceremonies, postponing the official registration until the bride reaches the legal age(19); despite the fact that, the current study adopted direct interviews with eligible mothers, a design that helped to disclose such mystery.

The present study suggested that popularity of early child marriage that defies all legislations is a product of various socio-cultural factors. Child marriage was significantly

associated with couples' illiteracy and consanguineous marriage. Consanguineous marriage which is a noteworthy feature of marriage in the Arab societies in general(18) and found among 65.4% mothers in the present study, was proved to be significantly associated with almost two fold increment of child marriage (OR=1.9, p=0.000). In Egypt, DHS in 2005 reported that 32.2% of ever married women were married to their blood relatives. This figure was higher in rural (38%) than in urban areas (24%) and further increased as the socioeconomic level of the household decreases(20).

Regarding illiteracy, the present study verified that none of mothers who engaged in early child marriage completed 12-years' schooling. However, the precise nature of the interaction between education and early marriage is not always evident; are girls withdrawn from school to marry? Or does lack of schooling for girls that is part of traditional expectations and roles push them to engage in early marriage? Anyhow, early marriage is recognized as one of the reasons why girls are excluded from school and thus reinforces the vicious cycle of early marriage, low education, high fertility, and poverty, especially in cultural settings where girls are raised for a lifetime confined to household occupations.(21) Early marriage is one important reason why girls leave school as many parents still believe that investment in a girl's education is wasted when she is simply going to be married and work in another household. The costs of the investment in education reinforce the impetus towards the girl's withdrawal from school(22). Along with moving up couples' age at marriage; education initiated opportunities for both partners to catch high-income job and to allow them to step up the social hierarchy (23). The present study indicated that no early child marriage was recorded by mothers of high social classes (1st and 2nd).

A Fact sheet issued by WHO(24) in May 2012 stated that globally about two million girls under the age of 15 give birth every year. Almost all

(95%) occurred in low- and middle-income countries. Within countries, child births are more likely to occur among poor, less educated and rural populations. Such a portrayal seems to be softer than that recorded in Niger where the rate of early marriage is one of the highest in the world; girls who manage to attend school are more likely to drop out in the absence of prospects to perform well and advance.

Jejeebhoy et al.(25) in 2003 showed that in almost every country in South Asia, education tends to increase the age at first marriage and women with fair education may get married two to five years later than uneducated women. They mentioned that only 15% of adult women were literate and less than one-third of girls were enrolled in primary school, as a result, girls would become more vulnerable to be exposed to the risk of early marriage. Besides, uneducated parents, as Jejeebhoy et al. added, are most likely to be ignorant of laws prohibiting child marriage and of the serious health risks that early sexual debut and pregnancy pose for girls. They are also more likely to consider females' education as a wasteful rather than a sound investment. What's more UNICEF(26) in 2012 found that women with seven or more years of education marry an average of four years later and have 2.2 fewer children than those with no education.

A cross sectional study of 26 developing countries sponsored by the UN in 2005(27) found that age at marriage invariably increases with the level of education in all of the countries examined, despite the fact that the age at marriage varies widely across countries. On the other hand, female education has been observed to be associated with greater numbers of women not marrying at all. Women with higher educational levels, as UN stated, are more likely to be able to organize their lives outside the sphere of marriage and family. For example, in Thailand, only about 1.9% of women without education do not marry, whereas 14.6% of highly educated women do

do not marry(27).

In conclusion, popularity of early child marriage defies all legislations and remains the norm. It had been experienced by 15.7% of mothers with formal registration, and under civil, religious or customary laws. It is a product of various socio-cultural factors particularly among illiterate and consanguineous couples. The present study recommends that all efforts are needed to encourage school-attendance of all children without gender discrimination as an intention for stopping child marriage. Besides, health education about risks of child marriage should be incorporated within the process of formal education.

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# Treatment of Helicobacter pylori infection in pregnant women with hyperemesis gravidarum

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## Introduction

Nausea and vomiting of pregnancy (NVP) commonly known as morning sickness affects approximately 80% of pregnant women. It is generally a mild condition and may be controlled with conservative measures (1) but a small percentage of patients develop a more profound course with the severe form being hyperemesis gravidarum (HG)(1). NVP typically occurs between the 4th and the 10th week of gestation with resolution by 20th week of gestation (2). NVP is commonly defined as extreme nausea and vomiting accompanied by a weight loss to at least 5% below pre pregnancy weight which can be associated with serious maternal and fetal morbidity such as Wernickes encephalopathy, fetal growth restriction and even maternal and fetal death(3,4).

Although there are several theories, the exact cause of HG remains unclear. Recently, many studies found that over 90% of pregnant women with hyperemesis gravidarum were infected with H pylori (5, 6), so H pylori might play a role in the etiology of HG. This could be explained by: early in pregnancy changes in body fluid concentration caused by elevated steroid hormones, will affect the acidity (PH) of the stomach, which may activate latent H pylori residing in the stomach resulting in the appearance of manifestation of a subclinical H pylori infection.(7,6)

Proton pump inhibitor (omeprazole) is effective in relieving of upper GIT symptoms of at least moderate severity regardless of the state of infection with H pylori, whether negative or positive. (8) Controversy exists regarding the type of therapy for eradication of H pylori that should be given to pregnant women. A combination of two antibiotics and proton pump inhibitors are typically given to eradicate the bacteria. (5,9)

## Abstract

**Background :** Hyperemesis gravidarum (HG) is extreme nausea and vomiting of pregnancy of unknown etiology. Helicobacter pylori infection (H pylori) may play a role in the etiology of the disease.

**Aim of the study :** To verify the role of H pylori in pathogenesis of HG and whether treatment will improve patients' symptoms.

**Study design:** Randomized controlled Clinical trial

**Patients and methods:** 46 pregnant women in their first pregnancy were included in this study all complaining of hyperemesis gravidarum and positive immunoglobulin G (IgG) for H pylori. The patients were divided into two groups:

The 1st group (control group, 22 patients): received traditional treatment for HG (intravenous fluid, antiemetic drugs, and anti motility drugs, multivitamins).

The 2nd group (study group, 24 patients): received treatment for H pylori (metronidazole 500mg twice daily +amoxicillin 1 gram twice

daily+omeprazole20mg twice daily). Both groups were observed for number of vomiting attacks per day, persistent ketonuria, need for hospitalization for HG .

**Result:** There was a significant decrease in the number of vomiting attacks per day, persistence of ketonuria and need for hospitalization in the study group in comparison to the control group.

**Conclusion:** We found significant improvement of the symptoms of HG in pregnant women with positive IgG for H pylori when they received treatment for eradication of H pylori.

**Key words:** HG, H pylori

Standard initial treatment of triple therapy for 7-14 days includes amoxicillin, clarithromycin, PPI and the 2nd line therapy includes amoxicillin, metronidazole, PPI(10). Clarithromycin should not be used unless phenotypic or genotypic test shows that the strain is susceptible (11). It belongs to category C by the FDA. The manufacturer recommends that Clarithromycin not be used in pregnant women except in clinical circumstances when no alternative therapy is appropriate and the benefit justifies the potential risk to the fetus.(12)

Amoxicillin is recommended for use in pregnant women(class B FDA pregnancy risk category ); no adequate and well controlled studies have been done on pregnant women ; on animals it does not indicate risk to the fetus(13). Metronidazole can be used throughout of pregnancy in women carrying the bacteria according to the report of The center for disease control and prevention (CDC)(5)and according to meta-analysis metronidazole does not appear to be associated with increased teratogenicity(14, 15). It is class B FDA pregnancy risk category ( 16). Regarding the use of omeprazole in pregnancy, even in the first trimester omeprazole does not increase the risk of congenital abnormalities if used in recommended dose, and is considered as a safe drug (17,18,19), (class C FDA pregnancy risk category). Studies on animals show adverse effect and toxicity on fetus; no adequate and well controlled studies have been done on pregnant women(20). PPI triple treatment ( Amoxcilin, metronidazole, PPI) have been tested as a 2nd choice treatment with eradication rate 89%-64%.(21)

The recommended duration of triple therapy is typically 10-14 days in US and 7 days in Europe, but a recent meta-analysis showed that the rate of eradication was increased by 4% points use of triple therapy for 10 days as compared with 7 days and 5% for 14 days as compared with 10 days.(21 )

## Aim of the study

.To verify the role of H pylori in pathogenesis of HG and whether treatment will improve patient's symptoms.

## Patients and Methods

This study was extended from October 2010 till August 2012. Patients included in this study were recruited from private clinics and out patient's clinic at AL-Yarmouk teaching hospital. Informed consent was obtained from all participants, and the study was approved by the ethical committee. All patients included in this study were complaining of hyperemesis gravidarum (HG), primigravida and between 10-16 weeks of their pregnancy. The following criteria for the diagnosis of HG was dependent upon: presence of ketone in urine more than +2, vomiting more than 3 times per day, weight loss more than 5% of body weight prior to pregnancy. All patients were sent for IgG antibody for H pylori using anti-helicobacter pylori IgG ELISA Kit (catalog no. ABIN 649031 antibodies -on line inc. Atlanta USA) and patients with negative tests were excluded from this study. Full history was taken, clinical examination, measurement of height and weight and calculation of body mass index. All patients were sent for the following investigations: Renal function test, liver function test, electrolyte level, general urine exam, and complete blood picture and ultrasound.

**Exclusion criteria:** Patients with negative immunoglobulin test for H pylori, patients with multiple pregnancies, missed miscarriage, molar pregnancy, patients with history of medical disorder (biliary, hepatic, pancreatic disease), increased intracranial pressure, patient on chronic medication and on NSAIDs, patients with previous history of peptic ulcer disease, and patients who received previous treatment for H pylori.

The patients included in this study were divided into two groups : The 1st group (control group) of patients received the traditional

treatment of HG which includes the following: intravenous fluid, multivitamins (pyridoxine 25 three times per day, thiamine 100mg per day for three days) ,ginger, motility drugs (metoclopramide 5-10 mg per day ), antiemetic drugs (prochlorperazine, stimetil 5-10mg three times per day) (1,18).

The 2nd group (study group) received treatment for H pylori; current guidelines recommended that treatment of H Pylori should include triple therapy proton pump inhibitor ( PPI) and two antibiotics and the treatment should continue for 10 day with 64%- 89% eradication rate(10,11,22). Treatment includes: proton pump inhibitor (PPI - omeprazole) 20 mg twice per day, amoxycillin 1 gram twice daily, metronidazole 500 twice per day.

**The patients were distributed randomly in the two groups :** the 1st patient was put in the 1stgroup and the 2nd patient was in the 2nd group and 3rd patient was put in the 1stgroup and so on. All patients were followed up for the following: vomiting: no. of vomiting attacks per day stop, decrease, remain the sameketonuria: persistent, decrease or ; absent; weight loss: continuous weight loss or stop, need for subsequent hospitalization when symptoms persist or became worse. Statistical analysis: T test was used for analysis of age, BMI, chi-square was used for analysis of educational level, presence of ketonuria and need for hospitalization, chi square test for trend for analysis of vomiting attacks per day.

P Value  $\leq 0.05$  was considered to be significant.

## Results

Fifty patients were included in this study ,four patients were excluded subsequently (one patient with multiple pregnancy ,one patient with abnormal thyroid function test another two patients received treatment for H- pylori before few months .forty six patients completed this study: Control group: 22patients received traditional treatment for HG

**Study group:** 24 patients received treatment for H pylori plus traditional treatment for HG.

**Table 1: Demographic criteria for the patients in both groups**

Criteria	Control group	Study group	P value
Age (mean± SD)	20.3±3.04	18.25±5.06	0.1
BMI(mean ±SD)	19.86±1.48	19.45±1.47	0.35
Educational level ≥12 (years no. of patients)	13	17	0.5
Time for onset of symptoms in weeks of ±gestation( mean SD)	6.9±0.9	7±0.7	0.7

There is no significant difference in age, BMI or educational level in both groups.

**Table 2: The response to treatment measure by need for hospitalization , persistence of ketonuria and number of vomiting attacks per day**

Criteria		Control group (22) No. of patients %	Study group (24) No. of patients %	P value
Need for hospitalization		16(72.7)	5(20.8)	0.0012
Persistence of ketonuria		14(63.6)	5(20.8)	0.0001
No. of vomiting attacks per day	No vomiting	8(36.3%)	14(58%)	0.15 P value for trend ≤ 0.07
	Decrease vomiting attacks below 3 times per day	4(9%)	6(25%)	
	Continuous vomiting attacks more than 3 times per day	10(45.4%)	4(16.6%)	

As shown in Table 2 there is a significant difference between the 2 groups regarding the need for hospital admission, persistence of ketonuria , and number of vomiting attacks per day as shown in Figures 1, 2, 3 (next 2 pages) respectively.

## Discussion

Gastrointestinal symptoms during pregnancy are common in primigravida women, young age and less educated women (23). Thus in this study we matched the groups of patients for age, parity, gestational age, body mass index and years of education.

In this study 62.5% of primigravida women with HG were positive for H pylori, 61.5% were reported by Hayakawas et al(24); higher incidences were reported by others at

85.1%, 88.9%, 88%, 90%( 25 ,7,6,5 ). This might reflect the inadequate sanitary practices, inadequate nutritional status, low social class, crowded environment.

This high incidence of H pylori seropositivity in pregnant women can be explained by: increase in steroid hormones during pregnancy causing fluid accumulation and change in PH. These PH changes in the gastrointestinal tract (GIT), in addition to gastrointestinal dysmotility could lead to the manifestation of a latent

H pylori infection.(26) In this study omeprazole in combination with two antibiotics was effective in stopping vomiting in 58.3% of patients after a 10 days course of treatment and 25% of patients showed improvement.

In a study involving 80 pregnant women with HG, there were eight patients with severe symptoms not responding to treatment in spite of intravenous fluid, electrolyte replacement and antiemetics and vitamin supplementation. The eight patients received treatment in the

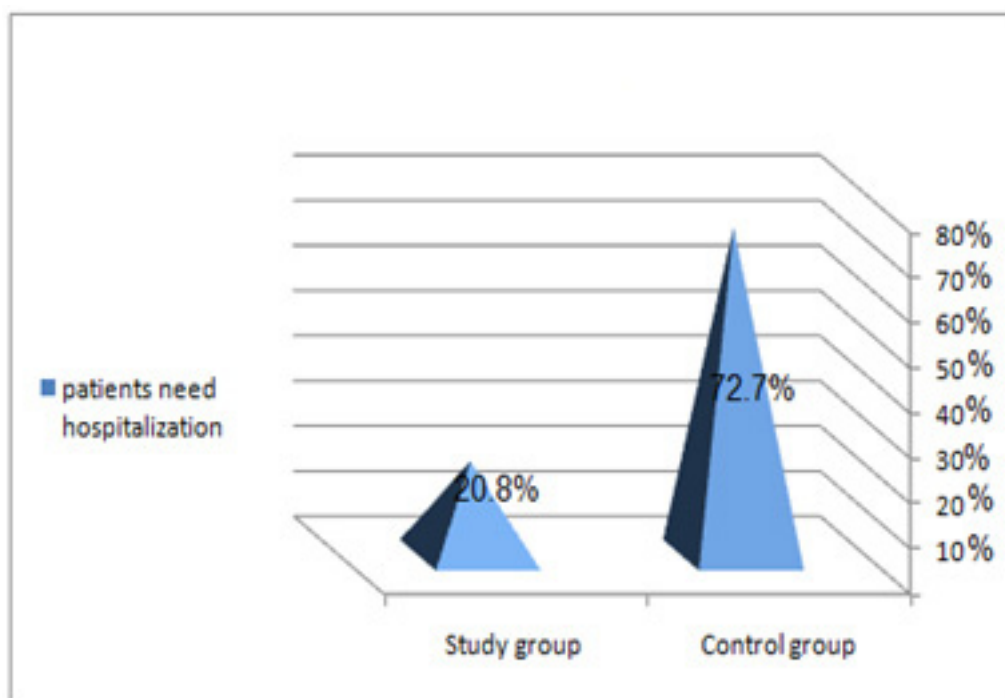


Figure 1: Percentage of patients needing hospitalisation in both groups

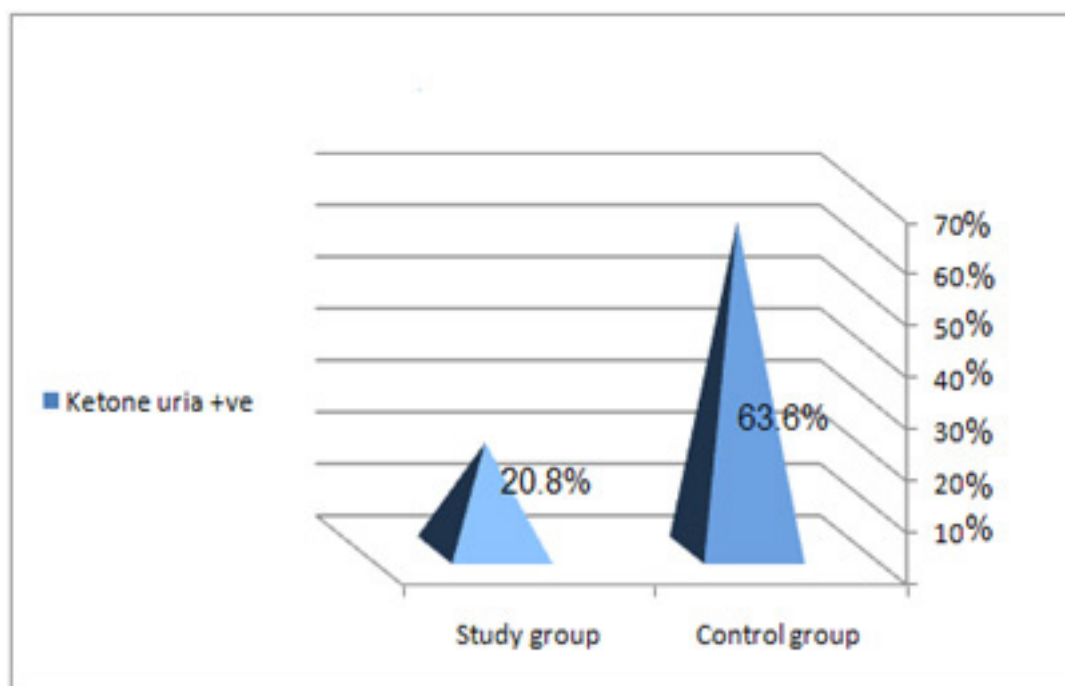


Figure 2: Percentage of patients with persistent ketone uria in both groups

form of (Ranitidine, metronidazole, ampicillin) for two weeks. 75% of those patients responded to eradication treatment with decreased number of vomiting attacks per day and reduced epigastric pain, 25% responding to increased doses of antacids and continued their pregnancy safely until delivery.(6) Another study included three pregnant women with Hyperemesis gravidarum not responsive to standard therapy, and positive to

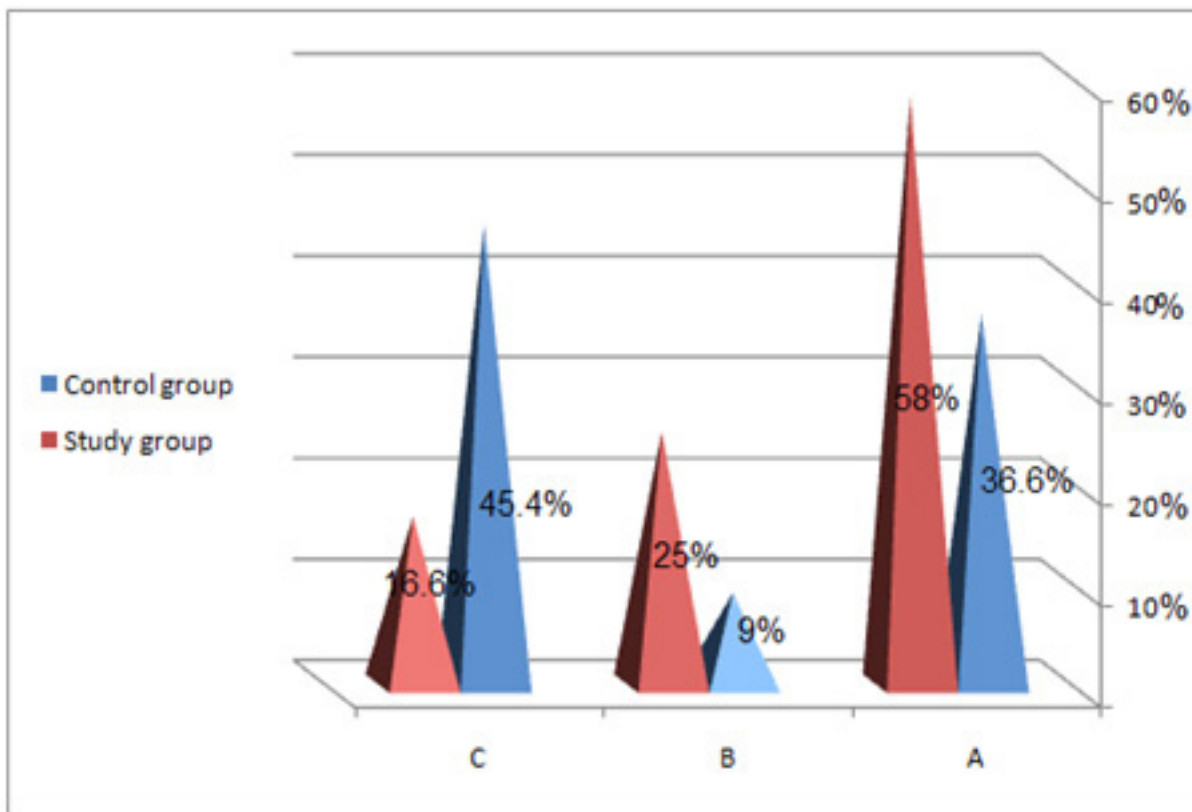
H pylori, resulted in resolution of the HG after a 2 weeks' course of antibiotics and proton pump inhibitor(27).

Omeprazole proved to be effective in stopping the vomiting immediately in a case report of a 27 year old female with severe HG not responding to all therapeutic efforts (28). Omeprazole was shown to be effective in relief of upper GIT symptoms of moderate severity; 62.7% of patients improved

after 4 weeks of treatment and a lesser proportion of patients with symptoms aggravated after completion of treatment.(8)

### Conclusion

Triple therapy for H pylori in pregnant women with HG who are IgG positive for this bacteria results in significant improvement of their symptoms.



**Figure 3: Percentage of patients with vomiting in both groups, after treatment**  
**A: percentage of patients with no vomiting**  
**B: percentage of patients with decreased vomiting, <3 attacks per day**  
**C: percentage of patients with continuous vomiting >3 attacks per day**

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# The Pattern of Feeding in the First 6 Months among Infants in Riyadh

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## Introduction

Breastfeeding is the ideal and the most natural way of nurturing infants. The World Health Organization recommends exclusive breastfeeding in the first 6 months of life (1). A nationwide nutritional survey of a sample of Saudi households shows that the prevalence of initiation of breastfeeding is 91.6% (2). The majority of mothers start breastfeeding their infants but soon introduce bottles. The single most common reason cited for the early introduction of bottle feeding is that the breast milk is insufficient (2). Exclusive breastfeeding at birth was reported in 76.1%, which declined to 32.9% and 12.2% at the age of 2 and 6 months, respectively (3). Increased maternal age, multiparity (three or more children), and vaginal delivery were significant positive predictors for early breastfeeding initiation (3). Rural, less-educated, low-income and multiparous mothers were more likely to exclusively breastfeed their infants(3). Irrespective of educational status, surveyed mothers demonstrated several misconceptions towards breastfeeding (3). Furthermore, early initiation and exclusivity were significantly influenced by sociodemographics, especially maternal educational and employment status(3). The high prevalence of breastfeeding initiation at birth indicates the willingness of Saudi mothers to

breastfeed. Prevalence of exclusive breastfeeding was low in Saudi Arabia(4). The percent of exclusive breastfeeding was 1.7% and the partial breastfeeding breast milk with formula was the most common type of feeding (78.8%). Lactation duration dropped to 50% at 6 months of age. Factors favoring the milk formula use were introduction of the formula in the first day of life and maternal reasons of inadequate milk. Lactation duration and formula introduction were found to be significantly associated with mothers' parity, working status, and combined contraceptive pill use (4).

## Objectives of this study

- 1- To assess the pattern of feeding in the first 6 months among Saudi infants attending the primary health care centers in Riyadh.
- 2- To identify the potential factors that may influence the pattern of feeding.
- 3- To assess the awareness of mothers about the importance of breastfeeding and do they support the educational classes.

## Methodology

The study was a cross-sectional descriptive study aiming at assessing the pattern of feeding in the first 6 months among Saudi infants attending the primary health care centers clinics in Riyadh.

Study population was all Saudi infants at 6 months old who attended the primary health care centers to receive the vaccination for the 6 month.

All infants 6 months old and with Saudi nationality were included in this study. Infants with chronic diseases and twins were excluded from this study. Assuming the prevalence of breastfeeding is 12% (3), by using equation of estimation of single proportion and if absolute precision is 6%, the sample size was 190 participants. After adding 10% for drop out, the sample size was 210 participants; by using non-probability convenience sampling method until the sample size was reached.

## Results

A total of 210 women were interviewed during 3 months. In the study sample the boy infants were (54.8%). Most of the infants (75.2%) were delivered by normal vaginal delivery. Most of them were full term pregnancy (82.4%). Most of the infants did not stay in nursery (84.8%). The majority of the mothers in this study (99%) were married. Many of the mothers (65.2%) had university education, followed by (18.1%) who had secondary school education, then (9.5%) had the intermediate school. Almost half of the mothers in the study sample (53.8%) were workers. The history of the initiation of breastfeeding was reported by (89.5%) but only (19.7%) of the mothers continued breastfeeding to 6 months and (21.8%) of them stopped breastfeeding in the first month after birth. There was (7.6%) on exclusive

breast feeding for 6 months. There were (10.5%) of mothers who did not breastfeed at all. There were two most common reasons for not establishing breastfeeding; they were child refusal (36.4%) and child health problem (36.4%).

After that mother's health problem (13.6%), insufficient breast milk (9.1%) and working mothers were (4.5%); there was a statistically significant association between the history of initiation of breastfeeding with full term pregnancy ( $p=0.033$ ). The infants did not stay in the nursery ( $p=0.004$ ) and the level of education of the mother as university and above ( $p=0.010$ ). There was a statistical significance between the complete 6 months of breastfeeding with working mothers ( $p=0.027$ ). There was no statistically significant association between the initiation of breastfeeding with the age of the mother, the parity, type of delivery, the working status, if mothers had chronic disease or postpartum depression, father's educational level or family income. The history of introducing formula milk was reported by (92.4%). 70.1% of the mothers started formula at birth and (5.7%) of the mothers introduced it at 6 months. The reasons for starting formula milk were insufficient breast milk (38.8%), then busy mother (17.4%). The majority of the mothers (92.4%) introduced the liquid during the first 6 months. Water was the most common form of liquid introduced (91.2%). Most of the mothers introduced solid food to their children during the first 6 months it was reported (65.2%). There was a statistical significance between introducing the food with the high family income  $>10,000$ RS ( $p=0.041$ ) also with the house wife mother ( $p=0.020$ ) and with mothers who did not have any chronic disease ( $p=0.012$ ). Most of the mothers (62.9%) thought that breast milk is not enough for their infants during the first 6 months of life. Only (38.6%) of the mothers supported exclusive breastfeeding.

## Discussion

Our results were similar to many studies done in Saudi Arabia.

A nationwide nutritional survey of a sample of Saudi households (EL Mouzan, 2004) showed similarity in the pattern of feeding; a prevalence of initiation of breastfeeding was 91.6%. The commonest cause given for stopping breastfeeding was insufficient milk (45.5%), followed by illness of the mother, breast problem and illness of baby. (3) The level of education of the mothers was an important factor positively affecting initiation of breastfeeding ( $p=0.010$ ). Children did not stay in nursery ( $p=0.004$ ) and full term pregnancy ( $p=0.033$ ) also were positive predictors. Also in our study there was a statistical significance between the complete 6 months of breastfeeding with working mothers ( $p=0.027$ ). This is comparable to the results from another study which was carried out in Saudi Arabia (EL Mouzan, 2004). (3) Increased maternal age, multiparity and vaginal delivery were significant positive predictors for early breastfeeding initiation as revealed by stepwise logistic forward regression. (3) A Study done in Riyadh (Al-Hreashy, 2005) showed the breastfeeding initiation was 95%. The percent of exclusive breastfeeding was 1.7%. This percent is much smaller than our result. (4) A study done in Riyadh (Al-Hreashy, 2005) showed most mothers supplemented the infants with milk formula (83.4%) during the first 6 months. (4) Another study that was carried out in Saudi Arabia (EL Mouzan, 2004) showed there was a history of (8.4%) who were formula fed and therefore never breastfed. (3) Our result was similar to a study done in Riyadh (Al-Hreashy, 2005) that showed most of the mothers supplemented the infants with fluid (94%). (5) Our result was similar to another study carried out in Saudi Arabia (EL Mouzan, 2004) that showed the majority of infants 3870/4787 (80.8%) were introduced to "solid foods" between 4 to 6 months of age. (3) In one a nationwide survey was done which showed solid food tended to be introduced late and this was significantly related to age and education level. (2) Most of the fathers (98.5%) supported breastfeeding. Most of the mothers

(62.9%) thought that the breast milk was not enough for their infants during the first 6 months of life. So (60%) of the mothers preferred to give their infants both breastfeeding and formula milk regardless to their practice. Most of the mothers (71%) did not receive any education about breastfeeding. Level of mother's education ( $p=0.010$ ), profession ( $p=0.001$ ) and the family income ( $p=0.021$ ) were positive predictors. Also the younger mothers were a positive predictor for supporting the educational clinic; it was statistically significant ( $p=0.005$ ). A cross-sectional study was carried out in Pakistan (Ali S, 2009) that showed the majority of the females were aware of the advantages (92%) and the disadvantages (85%) of breastfeeding. (10) A cross sectional study was conducted in Australia (Wen LM, 2008) that shows 61% of mothers knew the WHO recommendation of exclusive breastfeeding for six months. Only 42% of all mothers intended to meet the recommendation (breastfeed exclusively for six months). The only factor associated with awareness of the recommendation was mother's level of education ( $p = 0.02$ ). (11)

## Recommendations

- 1- Health education program carried out by health care providers should be developed and implemented to overcome potential barriers of practicing breastfeeding.
- 2- Increase community awareness regarding breastfeeding through mass media campaigns, video presentation, schools and universities visits and invitation of family members in health education sessions.
- 3- Establish a nursery in the places of mother's work, health education subjects including breastfeeding as curriculum in the high school and establishing a breastfeeding education clinic.
- 4- Further studies are needed to be carried out on a community level.



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# Spontaneous atraumatic extensor pollicis longus rupture in healthy individuals due to steroid injection: Two case reports

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## Abstract

**Introduction:** Local steroid injection is believed to be associated with risk of spontaneous tendon rupture. Spontaneous rupture of the extensor pollicis longus (EPL) tendon at the wrist is infrequent and essentially described after fracture of the distal radius. Rough bone ends, rheumatoid arthritis, lupus erythematosus, synovitis or tenosynovitis both contribute to this process. The aim of this study is to define rupture of the EPL tendon with review of the literature in two cases after receiving local steroid injections.

**Case presentation:** The operative records for two patients undergoing EPL reconstruction by an author were criticized. All 2 patients had exposure to local steroids but this exposure was not into the ruptured tendon. It is administered about 2 cm away from the tendon. We identified 2 patients who presented with spontaneous EPL tendon rupture owing to steroid injection. These patients reported no risk factors or inciting event other than steroid injection. EPL were operatively repaired in two cases. At the 2-year follow-up, patients could completely extend the thumb. The cases were from the Eastern Mediterranean region of Turkey.

**Conclusion:** In patients with unexpected loss of extension of the thumb interphalangeal joint, with a history of steroid injection, rupture of EPL tendon should be considered even if it was administered to remote location.

**Key words:** Tendons; rupture, spontaneous; steroids

## Introduction

Corticosteroids have been associated with tendon rupture in multiple areas of the body. Rheumatoid arthritis, lupus erythematosus, fractures of the distal radius, local or systemic steroid injections, and repetitive and excessive abnormal motion of the distal radius may be the reason for spontaneous rupture of the EPL tendon [1-3]. Björkman and Jörgsholm stated 8 cases with EPL rupture associated with steroid use.

In all of these patients, steroids were administered systemically or injected into the tendon that eventually ruptured [4]. EPL rupture is mostly repaired with palmaris longus graft or transfer from the extensor indicis proprius [1,5-8]. We encountered 2 cases of spontaneous rupture of the EPL tendon associated with local steroid injection. All 2 patients had exposure to local steroids but this exposure was not into the ruptured tendon. It was administered about 2

cm away from the tendon. We report these cases with a review of the relevant literature.

## Case presentations

We defined 2 patients who underwent reconstruction for spontaneous tendon rupture due to local steroid injection with no history

of trauma or systemic disorder. All 2 patients had received corticosteroids in the same extremity and ultimately EPL ruptured. The cases were from the eastern Mediterranean region of Turkey.

### Case 1 patient

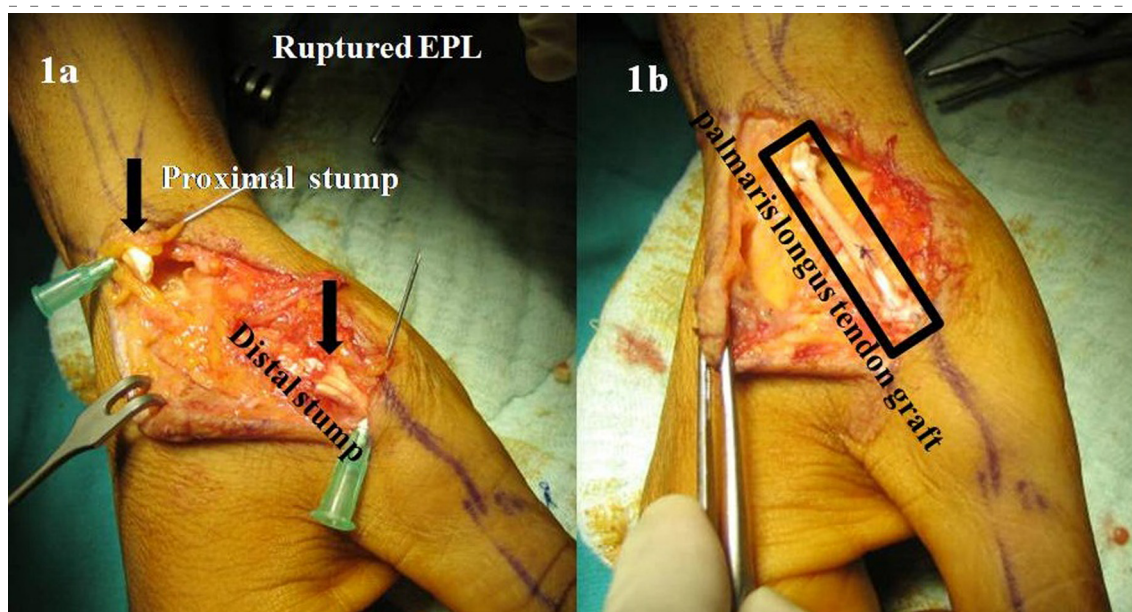
A 30-year-old male was admitted to our hospital with a loss of full extension of the interphalangeal joint in the left thumb. The patient had no history of trauma to the hand or rheumatoid arthritis. She had received local steroid injection for stenosing tenosynovitis of the abductor pollicis longus and extensor pollicis brevis tendons one month

ago. A physical examination revealed mild tenderness and swelling over the anatomic snuffbox. Flexion of the interphalangeal joint of the thumb was possible but loss of active full extension was recognized with no tenodesis effect and no findings of laceration or scars on the hand. There was no pathology on plain radiographs. The clinical findings clearly indicated an acute rupture of the EPL tendon. Surgical intervention was planned without an ultrasound or magnetic resonance imaging. An incision was made from the base of the thumb to the EPL tendon in the third compartment and a rupture was identified over the carpus (Figure 1a). Repair was

performed with an ipsilateral palmaris longus tendon graft (Figure 1b). The distal and proximal end of the graft were sutured to the stump of the EPL tendon using a modified Kessler technique. In the ensuing 6-month period, the case recovered full interphalangeal joint active extension.

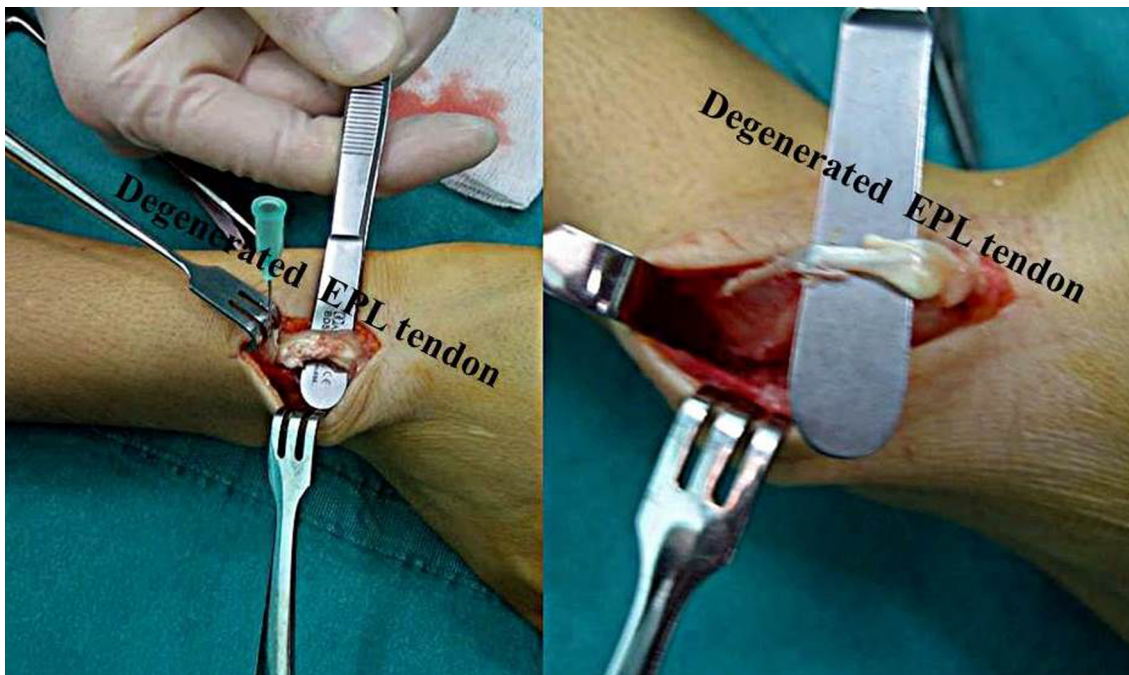
### Case 2 patient

A 26-year-old woman presented with spontaneous loss of extension of the right thumb at the interphalangeal joint for the preceding 15 days. The patient denied any trauma to the hand. She stated that she felt a sudden onset of pain, localized at the metacarpophalangeal joint, which lasted a few minutes only. This was followed by an inability to extend the thumb. Upon more questioning, the patient reported that 1 month earlier to this event she had been treated probably for synovitis at the first compartment of the wrist. The treatment consisted of injection of steroid. Palpation showed tenderness localized to approximately two centimeters proximal to the metacarpophalangeal joint. Passive hyperextension of the EPL tendon, which can be normally palpable, could not be palpated. Plain radiographs did not show any bone abnormality that could be related to the EPL rupture. Intraoperatively, the EPL tendon was



**Figure 1a: Incision for ruptured EPL tendon in the third compartment.**

**Figure 1b: Repair of EPL with an ipsilateral palmaris longus tendon graft.**



**Figure 2: Degeneration and attenuation of the EPL tendon.**

found to be disrupted 2 cm proximal to the metacarpophalangeal joint. Ruptured ends of the tendon adhered to each other with fibrous tissue and macroscopically there was significant degeneration and attenuation of the EPL tendon. The adhesion of the tendon may be the cause of functional loss (Figure 2). The ends of the tendon were debrided and sutured using a modified Kessler technique. After removal of the splint, passive and active range of motion exercises were started. After 1 year the case was completely recovered.

### Discussion

Injection of steroids is relatively safe and frequently used with some degree of success for treating synovitis; it should be administered with satisfactory precautions [9]. Spontaneous rupture of the EPL tendon after fractures of the distal radius is relatively common. EPL tendon rupture could occur without trauma due to attrition of the tendon around the abnormal Lister's tubercle, irrespective of age [10]. EPL ruptures can be initiated by repeated abnormal movements of the wrist joint [11]. It is stated that a spontaneous rupture of the EPL after wrist fracture was associated with an interruption of the tendon's vascularity than attrition. [12] Even though it is mostly an inflammatory response, local or systemic steroid

injections are considered one of the main causative factors [10]. Mostly seen inflammatory disease is rheumatoid arthritis. Tophaceous gout infiltration, [7] ankylosing spondylitis, scaphoid fractures, metal plates or misplaced external fixators, are other factors [10].

Prolonged systemic steroid therapy is the reason for re-rupture after repair. Therefore, great care should be taken to avoid failure of fixation and early re-rupture in cases requiring a long-term systemic steroid therapy [13].

Many studies have researched the mechanism as to how the steroid may cause tendon rupture. Triamcinolone suppresses proteoglycan production by human tenocytes [14]. Additionally Triamcinolone also suppresses collagen production, which may disturb the structure of the tendon [15]. These factors may promote spontaneous rupture of the tendon. Tendon ruptures in the hand frequently occur one or two weeks after a steroid injection. The ruptured tendons are frequently in the regions close to steroid injected areas [16].

A graft is necessary to bridge a long defect when a tendon transfer is either impossible or undesirable. If a graft is selected, it should be rerouted

from around the Lister tubercle to avoid adhesion and abrasion of the graft [17].

There are several studies where palmaris longus graft was used [1,2,18]. In a study Schaller P et al compared extensor indicis transposition or an intercalated free tendon graft. For isolated secondary reconstruction of the EPL tendon, both the extensor indicis transposition and a free autologous tendon graft successfully restore thumb function. Thus, both surgical techniques can be considered equal alternatives [8]. It is shown that extensor indicis proprius transfer or free palmaris longus grafts yield good results after EPL rupture [18]. In another study also suggested are a palmaris longus graft in the acute rupture setting and a transfer from the extensor indicis proprius to the EPL tendon in the subacute or chronic setting. Results of all treatments seem to be clinically satisfactory [19].

In the present cases, a single steroid injection was administered. In surgery grossly, there appeared to be significant attenuation and degeneration of the ruptured ends. There was an extensive defect of the tendon thus palmaris longus graft was used. It is easy to take a graft and this is known by many surgeons. After 2-year follow-up, the patients

had good metacarpophalangeal and interphalangeal joint motion. Steroid injection into the third extensor compartment of the wrist and systemic use of steroid has been associated with EPL tendon rupture [20].

There was no clinical signs of an autoimmune disorder or a traumatic event that might promote such a rupture. Furthermore, the sites of steroid exposure, while on the affected extremity, were all 2 cm or greater away from the location of subsequent EPL tendon rupture. This case series suggests that steroid injection in a neighboring region may also be associated with EPL rupture [1]. These factors were not detected in our patients. We suspected that it was a technical error because third and first compartments are close to each other. However steroid injections were done by the senior author, we consider this is not possible. In an equine model it was confirmed that triamcinolone injected at the distal interphalangeal joint reached therapeutic concentrations at the navicular bursa [21]. These two cases propose that steroid injection in a neighboring area may also be associated with EPL tendon rupture like Rada's study [1].

## Conclusions

In the absence of a known etiology for rupture of the EPL in a patient, the proximity of steroid injections to the EPL tendon create a potential explanation for this rare effect. We concluded that although steroid injections for management of tenosynovitis may be relatively safe, improper administration could lead to serious complications such as complete rupture of EPL tendon that could require a surgical procedure.

## Abbreviations

**EPL:** Extensor pollicis longus

## Acknowledgement

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# Wernicke Encephalopathy Following Bariatric Surgery and Hyperemesis Gravidarum

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## Abstract

**Background:** Wernicke's encephalopathy is a well-known neurological complication of vitamin B1 deficiency that can occur following intractable vomiting secondary to different malabsorption conditions, alcoholism and hyperemesis gravidarum.

**Methods:** We report a 22-year-old female who presented for vertigo, truncal ataxia and multidirectional nystagmus in all directions of the gaze movement following several weeks of intractable vomiting, 2.5 months after a Roux-en-Y gastric bypass surgery and an unrevealed pregnancy. Because of several exposures to radiation while performing multiple X-rays and CT scans of the abdomen and

pelvis, the patient was recommended to undergo dilatation and curettage procedure.

**Results:** She was diagnosed with vitamin B1 deficiency secondary to hyperemesis gravidarum status and malabsorption syndrome following a gastric bypass. The diagnosis was confirmed by the drastic clinical improvement on replacement therapy with intravenous vitamin B1 before we obtained the blood vitamin B1 level which came back low.

**Conclusion:** Replacement with vitamin B1 should always be started as soon as the clinical suspicion of Wernicke's encephalopathy is raised to prevent the occurrence of permanent complications.

**Key words:** Wernicke encephalopathy, bariatric surgery, hyperemesis gravidarum

## Introduction

Wernicke's encephalopathy is a well-known central nervous system complication of thiamine (vitamin B1) deficiency. It is classically manifested by a triad of confusion, ophthalmoplegia and ataxia (1). It is found mostly in patients suffering from chronic alcoholism, bariatric surgeries, malabsorption syndrome and hyperemesis gravidarum.

Only one report in the literature described the occurrence of Wernicke's encephalopathy following gastroplasty and hyperemesis gravidarum(2). Herein, we report a 22-year-old female presenting with intractable vomiting following laparoscopic Roux-en-Y gastric bypass (RYGB) and undisclosed pregnancy leading to acute neurological manifestations evoking Wernicke's encephalopathy.

## Case presentation

A 22-year-old female patient presented to our institution in July 2011 for a 2-week history of intractable vomiting, one month following laparoscopic RYGB for morbid obesity (BMI of 46.62), in which 150 cm of small bowel were bypassed. She had already lost 30kg since her surgery. Physical examination was normal, revealing a soft abdomen with redundant skin and healed laparoscopy scars. Her laboratory workup was unremarkable, including a liver enzyme panel. An upright abdominal X-ray was normal. Gastroscopy revealed normal findings. An ultrasound of the abdomen was normal. An upper gastrointestinal series with barium was normal. She was discharged home on anxiolytics that partially improved her symptoms. However, 2 weeks later, the patient was readmitted for severe nausea, profuse vomiting and hiccups, with normal physical examination. CT scan of the abdomen and pelvis showed patent proximal and distal jejunal anastomoses, a distended gallbladder with slightly hyperdense content, and evidence of a heterogeneously enhancing mass on the anterior aspect of the uterus (Figure 1). A pelvic ultrasound was done, confirming the presence of

a gravid uterus, corresponding to 14 weeks of gestation. A beta HCG level was positive compatible with the gestational age. Due to the fetus' exposure to radiation, dilatation and curettage were advised and 5 days following the procedure, while still on Ceftriaxone, she started complaining of vertigo with recurrence of nausea and vomiting and development of tinnitus. Her neurologic examination showed multidirectional nystagmus with severe truncal ataxia causing her to fall in all directions. The motor and sensory examinations were all normal, as well as her mental assessment. The deep tendon reflexes were all present and symmetric with absent Babinski sign. Brain MRI with gadolinium was normal. Serum level of vitamin B1 was 35.8 ng/ml (normal range is of 66.5 to 200 ng/ml). She was started on intravenous thiamine hydrochloride replacement, 10 mg three times a day which led to prompt clinical improvement of her vertigo and nystagmus. Her gait and ataxia improved progressively and she was able to walk normally one week later, on treatment. Thereafter, the patient was discharged home on vitamin B1 replacement for life.

## Discussion

In 1881, Dr. Carl Wernicke first described a serious neurological disorder, manifested by a triad of acute mental confusion, ataxia, and ophthalmoplegia due to vitamin B1 deficiency(1). If left untreated, Wernicke's encephalopathy can lead to severe amnesia, Korsakoff psychosis, and even death.

Thiamine deficiency may lead to brain tissue injury and neuronal damage, especially in the regions with higher metabolic demands and high thiamine requirement. These include primarily the cerebellar vermis, dorsomedial thalamic nuclei, periaqueductal gray matter, and mamillary bodies. (3) With complete lack of intake, thiamine stores in the body may be depleted within 4 weeks. Lesions are seen in susceptible brain regions within 2 to 3 weeks of thiamine deficiency.(3)

Thiamine deficiency causes both central and peripheral nervous system disorders. However, in a retrospective autopsy review, only 16% of patients demonstrated the classic triad of the central manifestation of the disease(4).

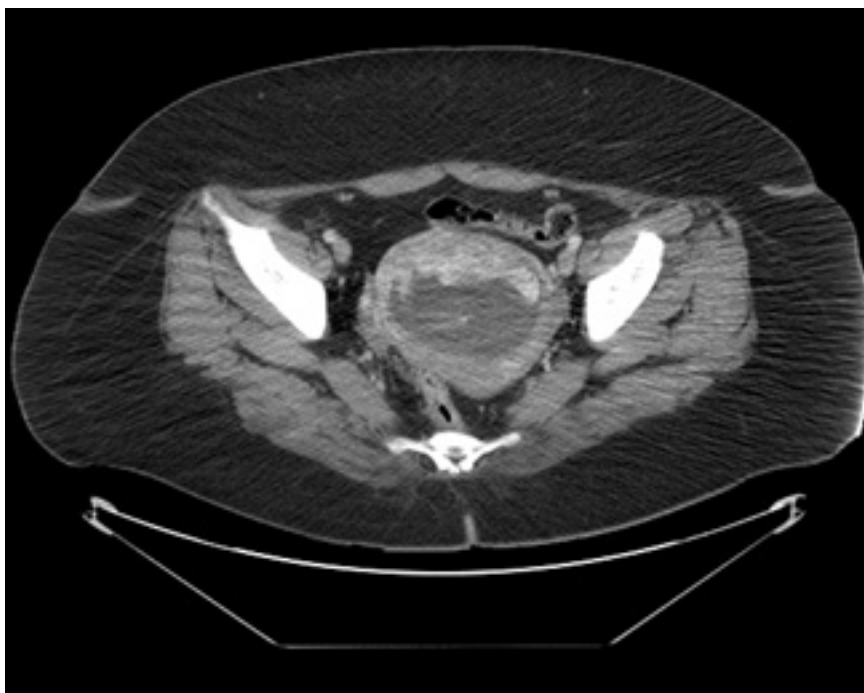


Figure 1: Pelvis CT scan showing a gravid uterus

Two extensive clinicopathological studies found that the incidence of oculomotor abnormalities was low, which leads to under recognition of the disease in cases where ophthalmoplegia was absent. Ocular anomalies may constitute presenting signs in up to 29% of patients, including nystagmus, conjugate-gaze palsies, and symmetrical or asymmetrical palsies of both lateral recti or other ocular muscles(4). Our patient had rotatory nystagmus without frank ophthalmoplegia, however, Wernicke's encephalopathy was strongly suspected, given the multiple risk factors we were faced with and the presence of truncal ataxia and vertigo.

Although most cases of Wernicke's encephalopathy are due to chronic alcoholism, with 30 - 80% of alcoholics having signs or laboratory studies compatible with thiamine deficiency (5), our patient was not found to be suffering of alcoholism. Other non-alcohol related conditions may also predispose to thiamine deficiency. Most of the gastrointestinal surgical procedures that lead to the resection or exclusion of portions of the tract may predispose to Wernicke's encephalopathy, polyneuropathy and wet beriberi(6). Our patient demonstrated the pertinent signs and symptoms of vitamin B1 deficiency and Wernicke's encephalopathy at 2.5 months post-surgery. With surgeries for morbid obesity, Wernicke's encephalopathy occurs mostly within 2 to 8 months post operatively, mainly in patients with a weight loss of greater than 7kg per month(7). Few cases are reported of the disorder manifesting as early as 2 weeks postoperatively, and as late as 20 years following gastrectomy(8). A recent systematic review (9) showed the occurrence of Wernicke's encephalopathy occurring 4 to 12 weeks post bariatric surgery, especially in young women with vomiting; the review also highlighted the frequency of atypical neurological symptoms.

Despite the availability of different diagnosing modalities, including laboratory work up,

electroencephalography and brain imaging, Wernicke's encephalopathy remains a clinical diagnosis, requiring a high index of suspicion. The presumptive diagnosis may be confirmed by measuring blood thiamine concentrations, or measuring the red blood cell transketolase activity. However, due to technical difficulty and lack of specificity, these tests are limited. MRI is currently considered a confirmatory test for Wernicke's encephalopathy, despite its low sensitivity of 53%, it has a 93% specificity to rule out the disorder(10,11). Typical MRI findings show an increased T2 signal in the paraventricular regions of the thalamus, mamillary bodies, periaqueductal region, the floor of the fourth ventricle and the midline cerebellum. These lesions are bilateral and symmetrical. However, these typical patterns are observed in only 58% of patients(11). The brain MRI in our patient was normal, and typical imaging findings of Wernicke's encephalopathy were not shown upon clinical suspicion; the diagnosis was confirmed later with low level of vitamin B1 and prompt clinical improvement with vitamin B1 replacement therapy.

In conclusion, in view of the multiple risk factors for vitamin B1 deficiency found in our case and the clinical context, the diagnosis of Wernicke's encephalopathy was promptly evoked upon presentation despite a negative MRI picture. Vitamin B1 therapy was then started early even before its confirmatory low laboratory results, which lead to complete resolution of the clinical symptoms and signs of our patient within few days. For this reason, we recommend to start replacement therapy with vitamin B1 as soon as possible, whenever the diagnosis of Wernicke's encephalopathy is raised to prevent the progression into definite irreversible complications even in the absence of the typical MRI findings of the disease.

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