

24 hour -Pregnancy Unique Quantification of Emesis Scale Usage to Quantify Nausea and Vomiting

Qurra-tul-Ain, Rabail Gul, Shagufta Yasmin , Syeda Batool Mazhar, Sadaf Zarar
Department of Gynae/Obs. Pakistan Institute of Medical Sciences, Islamabad

Abstract

Background: To assess disease burden of nausea and vomiting of pregnancy (NVP) and to perform external validity of the 24 hour PUQE score by examining its ability to evaluate various characteristics associated with NVP.

Methods: In this cross sectional study pregnant ladies with nausea and vomiting were included. PUQE -24 score and well-being scores were recorded. Chi square and fisher-exact test were used to assess association between PUQE score severity and qualitative variables. One-way ANOVA was used to find association between PUQE-24 score and wellbeing score. P value of <0.05 was taken as significant.

Results: A total of 117 patients at mean gestational age 10.61 weeks(±2.12) presented with NVP. Mild PUQE score was seen in 54.7%, moderate in 39.9% and severe in 15.4%. PUQE -24 score had significant association with severity of NVP, need of hospitalization,ER visits,need of intravenous antiemetics and fluids and lower well-being score.(p<0.05)

Conclusion:For the assessment of NVP symptoms, the PUQE- 24 seems as a reliable tool. It is simple and can help in patient management and follow up.

Key Words:24 hour -Pregnancy Unique Quantification, Emesis Scale, Nausea and vomiting of pregnancy (NVP)

Introduction

Most pregnant women suffer from nausea and vomiting of pregnancy (NVP). Around 70-80% of the pregnant women suffer from nausea while about 50% suffer from vomiting.¹ The symptoms of NVP vary in severity from mild to severe, with hyperemesis gravidarum (HG) at the extreme end of spectrum. HG is described by excessive nausea and vomiting, resulting in dehydration, nutritional deprivation and electrolyte disturbances and loss of 5% of pre-

pregnancy weight which often making hospitalization necessary.^{1,2}Health care providers often tend to underestimate impact of NVP due to its high prevalence and often self-limiting course . NVP does not lead to adverse pregnancy outcome in most of the cases,it badly impacts women's lives in many ways. ^{1,3} In 2002 the Pregnancy-Unique Quantification of Emesis (PUQE) scoring system was introduced. It assessed the severity of nausea and vomiting in pregnancy (NVP) centered on three physical symptoms: nausea, vomiting, and retching over the preceding 12 hours.^{1,4}Later 24-hour PUQUE score was introduced- an extension of the original PUQE, by assessing NVP over previous 24 hours. This extension to 24 hours is considered more clinically pertinent.^{4,5} The assessment of symptoms over 12 hours only may incorporate sleeping hours and so may not satisfactorily assess the severity and length of the symptoms.⁴

So far no studies have been done in Pakistani women to validate the 24 hour PUQE score. Cultural differences and differences between countries with respect to health care systems could alter results as data obtained in other countries ¹ may not apply for the our local pregnant population where most antenatal care is rendered by private sector and patients have to pay out of pocket.^{1,6}

Patients and Methods

This was a cross sectional study conducted from 1st May to July 2018 at MCH center,Unit 1 Pakistan Institute of Medical Sciences after approval of hospital ethical review board. All patients who consented to be included in the study and presented to OPD and emergency room(ER) with NVP with singleton, viable pregnancy upto 16 weeks gestation were included. Patients with urinary tract infections, gestational trophoblastic disease, hypertension, diabetes, threatened miscarriage, ectopic gestation, thyroid, cardiac and liver disease and diarrheal illness were excluded . Intake of oral or intravenous antiemetics ,

need of intravenous fluids were recorded . Any hospital admissions or visits to emergency department with nausea and vomiting prior to and in the month after her presentation were also recorded. Patient was labelled to have Hyperemesis Gravidarum (HG) if dehydration and electrolyte disturbances were present and >5% of pre-pregnancy weight was lost. The 24 hour-PUQE score has three criterion : how long did the patient feel nauseated, how many times did the patients throw up and how many times did the patient retch or have a dry heave without throwing up over last the preceding 24 hours. Each criteria was given a score of 1-5 depending on how frequent or how long a particular symptom is experienced. The total score of upto 6 was taken as mild, 7-12 as moderate, and greater than 13 as severe.⁴ The PUQUE score was calculated and entered . The well being score was also calculated and noted in the performa . It is a score of self-perception of psychological and physical health provided by patient when asked to rate her general well-being . The well-being score ranges from 0 to 10 .The worst possible well-being is rated as 0 and best well-being as 10 as compared with the woman’s health and well-being prior to pregnancy.⁴ Chi square and fisher-exact test were used to assess association between severity of PUQE score and, need for intravenous (IV) fluids, intravenous antiemetic, use of multivitamin, visits to emergency room (ER), presence of pallor and weight loss . One way ANOVA was used to compare severity of PUQE score and wellbeing score, patients’ blood pressure and pulse. P value of <0.05 was taken as significant.

Results

A total of 117 patients presented with nausea, vomiting of pregnancy in the OPD and ER during the study period. Majority (46.2%) were nulliparous (Table 1). . At their presentation to hospital, the incidence of pallor, dehydration, weight loss was much higher in women with severe PUQE score as compared to those with moderate and mild PUQE scores.(Table 2). Among these, 51% women had ER visits while 19.6% visited ER more than once with nausea and vomiting of pregnancy. Twelve pregnant women (10.26%) were diagnosed with hyperemesis gravidarum. Women categorized as having severe PUQE score had higher pulse and lower systolic and diastolic blood pressure. However the association with systolic blood pressure did not reach statistical significance.(Table 2). All of the 10 patients with HG had severe PUQE score. Similarly severity of PUQE score had significant association with different aspect

Table 1: Demographic Profile

variable	Sub-category	N	%
Age	Upto20 years	6	5.1
	21-30 years	91	77.8
	31-40 years	19	16.2
	>40 years	1	.9
Gestational Age	Upto 8 weeks	21	17.9
	9-13 weeks	83	70.9
	14-16 weeks	13	11.1
Education	Nil	28	23.9
	Primary	36	30.8
	Matric	25	21.4
	Graduate	13	11.1
	Prof education	15	21.8
Parity	Nulliparous	54	46.2
	Para1	33	28.2
	Multipara	29	24.8
	Grandmultipara	1	.9
Profession	Housewife	100	85.5
	Desk job	4	3.4
	Labourer	3	2.6
	Medical	7	6
	Others	3	2.6

Table 2: Association of PUQE score and studied variables

Variable		Mild N=64	Moderate N=35	Severe N=18	P- value
Intake of Multivitamin	Yes	37	6	1	0.00
	No	27	29	17	
Hospital Admission	Yes	1	5	15	0.00
	No	63	30	3	
Visit to ER	Nil	48	9	0	0.00
	1	16	18	3	
	2	0	8	13	
	3	0	0	2	
Need of IV antiemetic	Yes	2	8	18	0.00
	No	62	27	0	
Need of IV fluid	Yes	4	10	18	0.00
	No	60	25	0	
Dehydration	Yes	1	5	16	0.00
	No	63	28	2	
Pallor	Yes	20	16	10	0.12
	No	44	19	8	
Weightloss	Yes	0	6	12	0.00
	No	64	29	6	
Mean pulse		82.66 (±4.86)	85.71(±5.59)	91.17(±4.12)	0.00
Mean systolic BP		106.79 (±7.58)	107.97 (±5.38)	103.28 (±5.28)	0.057
Mean diastolic BP		73.12 (±8.47)	70.86 (±7.62)	66.11 (±5.01)	0.004

of management assessed in this study. More hospital admissions and ER visits were seen in patients with severe PUQE score as compared to those with moderate and mild scores. All patients with severe

PUQE visited ER once or more with 13 out of 18 patients visiting ER twice.(table 2) . All women found to have severe PUQE score needed intravenous fluids and intravenous emetics. (Table 2). Only 1 out of 18 women with severe PUQE score was taking multivitamins at time of presentation as compared to 6 out of 35 with moderate and 37 out of 64 with mild score.(table 2)

Among the total 117 women presenting with NVP, 64(54.7%) had mild, 35 (39.9%) had moderate and 18(15.4%) had severe scores using the 24 hours PUQE score (Table 3). Severity of PUQE SCORE was reflecting deterioration of quality of life. (figure 1)

Table 3: PUQE score

Score	No(%)
Mild	64 (54.70)
Moderate	35 (29.91)
High	18 (15.38)

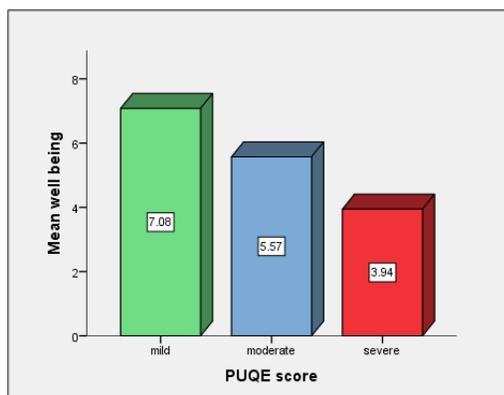


Figure 1 : Association of well being score and PUQE score p< 0.001

Discussion

Most expectant mothers suffer from nausea and vomiting of pregnancy (NVP) in the first trimester. The disease-burden can become substantial if symptoms are under-diagnosed and under-treated, thus permitting disease progression.⁷ A tool to gauge severity of NVP helps in timely and proper management of patients which is imperative.⁸⁻¹⁰

In our study 15% women were in severe PUQE score category as compared to the study by Koren et al (who devised PUQE score) in which 25.5% patients had severe PUQE score.⁴ Another study on NVP in Norwegian women revealed 29.5% women were categorized as having severe PUQE score.¹ As in other studies most of the patients in our study who presented with NVP were of younger age group, lower parity and were around 10 weeks gestation.^{5,10,11}

We used external parameters that mirror clinically the severity of the woman's symptoms to validate the modified PUQE score. We examined the rate of hospital admissions or ER visits that could be attributed to NVP. Hospitalization and repeated visits to ER cause substantial disturbances in patients' day to day lives and has financial impacts for patient, their families and hospital.^{11,12} High PUQE-24 scores is shown to be associated with higher hospitalization rates and more ER visits in our study similar to a study done by the team who devised PUQE-24.⁴ Similarly other studies have shown women with higher PUQE score were associated with more frequent ER visits and hospital admissions^{1,5,13} This study shows that higher PUQE score is also associated with lower blood pressure, higher pulse, dehydration and weight loss. This recognizes the more susceptible group of patients at risk of developing HG that is who are dehydrated, hypotensive and in need of intravenous fluids and for whom oral antiemetics do not suffice. All women in our study with HG had severe PUQE score. Likewise in other studies, higher PUQE score was seen in women with HG.^{5,13} As intravenous fluids and intravenous antiemetics, needed in this patient population, cannot be administered at home so these patients need hospital admissions and frequent ER visits. Timely stratification of women with NVP by PUQE score offers women and health-care givers with a chance to intervene before further deterioration of symptoms. This in turn may lead to need of hospital admission and repeated visits to ER.^{5,11}

As in other studies, lowest multivitamin and nutritional supplement use was seen in severe PUQE group followed by those with moderate PUQE score. So PUQE-24 scores were highly predictive of the inability to take multivitamins in cases of severe nausea.^{1,4,5,13} In general tablet folic acid are usually prescribed till 12-14 weeks gestation and iron plus folic acid and calcium plus vitamin C and D at later gestations. Women with NVP have altered and intensified sense of taste and smell.^{12,14,15} This might make them attribute worsening of symptoms to multivitamin use^{4,13} and they are unwilling to use even folic acid.¹⁶ These women may have difficulty is swallowing and retaining medications including multivitamins. Moreover iron is related to severe nausea and gastrointestinal symptoms.¹³ Women tend to avoid nutritional supplements that may make their already severe NVP worse.^{13,16,17}

Well-being is considered as a subjective parameter. It shows a patient's overall physical, mental and emotional health, demonstrating her quality of life at

the time of assessment. Our results reveal that PUQE-24 scores strongly correlate with this self-rated parameter. PUQE-24 can therefore be used in evaluating the severity of distress experienced by expectant mothers with NVP. This has been seen in other studies too where higher PUQE score was associated with lower well being score.^{4,5,13} As seen in other studies, NVP may occur at any time of day and night. It adversely affects daily activities, eating, fluid intake and ability to manage domestic and job-related responsibilities. Therefore a 24 hour score better reflects the severity of symptoms.^{4,18}

Conclusion

The PUQE 24 seems to be a reliable tool for assessment of NVP symptoms. It is simple to use and can help in patients management and follow up.

References

1. Heitmann K, Nordeng H, Havnen GC, Solheimsnes A. The burden of nausea and vomiting during pregnancy: severe impacts on quality of life, daily life functioning and willingness to become pregnant again—results from a cross-sectional study. *BMC pregnancy and childbirth*. 2017 ;17(1):75-79.
2. Refuerzo JS, Smith JA, Ramin SM. Clinical features and evaluation of nausea and vomiting of pregnancy. *Uptodate in clinical features*, 2012
3. Heitmann K, Svendsen HC, Sporsheim IH, Holst L. Nausea in pregnancy: attitudes among pregnant women and general practitioners on treatment and pregnancy care. *Scandinavian journal of primary health care*. 2016 ;34(1):13-20.
4. Ebrahimi N, Maltepe C, Bournissen FG, Koren G. Nausea and vomiting of pregnancy: using the 24-hour Pregnancy-Unique Quantification of Emesis (PUQE-24) scale. *Journal of obstetrics and gynaecology Canada*. 2009 ;31(9):803-07.
5. Birkeland E, Stokke G, Tangvik RJ, Torkildsen EA, Boateng J. Norwegian PUQE (Pregnancy-Unique Quantification of Emesis and nausea) identifies patients with hyperemesis gravidarum and poor nutritional intake: a prospective cohort validation study. *PloS one*. 2015 ;10(4):e0119962.
6. Shaikh BT, Hatcher J. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. *Journal of Public Health*. 2004 ;27(1):49-54.
7. Clark SM, Dutta E, Hankins GD. The outpatient management and special considerations of nausea and vomiting in pregnancy. *Seminars in Perinatology* 2014;38(8):496-502.
8. O'Donnell A, McParlin C, Robson SC, Beyer F, Moloney E. Treatments for hyperemesis gravidarum and nausea and vomiting in pregnancy: a systematic review and economic assessment. *Health Technol Assess* 2016;20(74):292-96.
9. Shehmar, MacLean MA, Piercy CN. The Management of Nausea and Vomiting of Pregnancy and Hyperemesis Gravidarum . *Royal College of Obstetricians and Gynaecologists* 2016
10. Choi HJ, Bae YJ, Choi JS, Ahn HK, An HS. Evaluation of nausea and vomiting in pregnancy using the Pregnancy-Unique Quantification of Emesis and Nausea scale in Korea. *Obstetrics & gynecology science*. 2018 ;61(1):30-37.
11. Fiaschi L, Nelson-Piercy C, Tata LJ. Hospital admission for hyperemesis gravidarum: a nationwide study of occurrence, reoccurrence and risk factors among 8.2 million pregnancies. *Human Reproduction*. 2016 ;31(8):1675-84
12. Maltepe C, Koren G. The management of nausea and vomiting of pregnancy and hyperemesis gravidarum—a 2013 update. *J Popul Ther Clin Pharmacol*. 2013;20(2):e184-92.
13. Koren G, Piwko C, Ahn E, Boskovic R, Maltepe C, Einarson A. Validation studies of the Pregnancy Unique-Quantification of Emesis (PUQE) scores. *Journal of Obstetrics and Gynaecology*. 2005 ;25(3):241-44.
14. Einarson TR, Piwko C, Koren G. Prevalence of nausea and vomiting of pregnancy in the USA: a meta analysis. *J Popul Ther Clin Pharmacol*. 2013 ;20(2):e163-70.
15. Cameron E. Measures of human olfactory perception during pregnancy. *Chemical Senses*. 2007 ;32(8):775-82.
16. Barbour RS, Macleod M, Mires G, Anderson AS. Uptake of folic acid supplements before and during pregnancy: focus group analysis of women's views and experiences. *Journal of Human Nutrition and Dietetics*. 2012 ;(2):140-47.
17. Gill SK, Maltepe C, Koren G. The effectiveness of discontinuing iron-containing prenatal multivitamins on reducing the severity of nausea and vomiting of pregnancy. *Journal of Obstetrics and Gynaecology*. 2009 ;29(1):13-16.
18. Clark S, Hughes B, McDonald SS. The impact of nausea and vomiting of pregnancy on quality of life: report of a national consumer survey and recommendations for improving care. *Obstetrical & Gynecological Survey*. 2013 ;68(9):S1-0...