

Guideline for Management of Hyperemesis Gravidarum

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Abstract: Hyperemesis gravidarum (HG) is the most severe form of nausea and vomiting of pregnancy which can have potentially dangerous complications if untreated. Its treatment is basically supportive as the condition itself is self-limiting. This study **aimed** to implement guideline for management of hyperemesis gravidarum. **Subjects and study design:** A quasi – experimental design, using one arm was utilized of 50 pregnant women who were attending outpatient clinic & inpatient high risk department at Kafer El-Shikh General Hospital, Kafer El-Shikh governorate, Egypt between January 2017 and September 2017. **Results:** There were a highly significant difference between before and after implementing guideline among the studied sample regarding signs and symptoms of dehydration, Ketonuria and Potassium investigations and vital signs. Also, it was found that Mean \pm SD was 34.2 ± 6.7 and 2.4 ± 0.7 regarding the duration of intravenous fluids and hospital stay in days respectively. There was a highly statistically significant difference among PUQE scoring index before and after implementing guideline ($P < 0.001$). A highly statistically significant difference ($p = < 0.001$) among nutrition and fluids intake of life style modification during the follow up from initial observation to the last observation. **Conclusion:** nursing care guideline gives an actual chance for helping pregnant women, increasing their sense of wellbeing, and reducing pregnancy complications and modify their life style after implementing HG guideline during the follow up. The study **recommended** implementing and distributing nursing care guideline for hyperemesis gravidarum through antenatal clinic and public hospitals during initial visit of the pregnant women is very important and helpful for their life experiences.

Keywords: Nursing care, Guideline, Hyperemesis Gravidarum

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I. Introduction

Nausea and Vomiting of Pregnancy (NVP) affects approximately 80% of pregnant women as a normal physiological change **Kejela, Getu, Gebretsдик & Wendimagegn (2018)**. Uncomplicated NVP, commonly known as “morning sickness,” is generally a mild, self-limited condition that may be controlled with conservative measures. A small percentage of pregnant women have a more profound course, with the most severe form being hyperemesis gravidarum (HG). Severe hyperemesis requiring hospital admission occurs in 0.3 % to 2% of pregnancies **Fiaschi L, Nelson-Piercy C, Tata LJ. (2016)**. According to the American College of Obstetricians and Gynecologists (ACOG), the most commonly cited criteria for HG include persistent vomiting not related to other causes, a measure of acute starvation usually large ketonuria and some discrete measure of weight loss, most often at least five percent of pre-pregnancy weight. Electrolyte, thyroid, and liver abnormalities may be present **American College of Obstetrics and Gynecology (ACOG) (2016)**.

The main etiology of HG is unknown: But it is most likely a multifactorial condition and has been associated with largely non-modifiable risk factors such as family history (genetics) or a history of HG in a previous pregnancy. Hyperemesis is also associated with female gestation, multiple gestation, current or prior molar pregnancy, and hydrops fetalis **Mekonnen, Amogne & Kassahun (2018)**. Primarily diagnosing of HG is determined by ruling out other underlying complications associated with persistent vomiting in addition there are some examination includes the following: vital signs, volume status, general appearance, thyroid evaluation, abdominal evaluation, cardiac evaluation, neurologic evaluation **Niemeijer, Grooten & Vos(2014)**. The management of HG is based on correcting electrolyte imbalance and dehydration, additionally prophylaxis against recognized complications, and providing symptomatic relief **McCarthy, Lutomski & Greene(2014)**. Non-pharmacologic options such as ginger, acupressure, acupuncture and chiropractic may offer symptomatic relief. Pharmacological treatments include antihistamines, anticholinergics, dopamine antagonists, 5-HT3 antagonists, corticosteroids, cisapride, and cannabinoids. Nursing care guideline gives an actual chance for

helping pregnant women, increasing their sense of wellbeing, reducing pregnancy complications and modifying their life style after implementing HG guideline during the follow up **Niebyl,(2010)**.

1.1 Significant of the study:

Hyperemesis gravidarum is a harmful condition associated with pernicious nausea and vomiting, it has various physical and psychological complications that affect the pregnant woman's health. It is associated with an increase in rate for hospitalization and health care; Losses of work time and decrease quality of life during pregnancy **Heitmann et al. (2017)**.The prevalence of hyperemesis gravidarum is approximately 0.3-3% of pregnancies and varies on account of different diagnostic criteria and ethnic variation **ACOG, (2015)**. Egypt faces many of constrains and current challenges to more decline in maternal and child mortality that if addressed so, Egypt give a push to achieve 2030 Agenda for Seventeen Sustainable Development Goals (SDGs) **WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division (2015)**. There is a high prevalence of HG among Egyptian pregnant women from Assiut in which 4.5% of pregnant women who were admitted to the Woman's Health Center had HG **Mahmoud et al.,(2012)**.Also, Egyptian hospital has an insufficient number of facilities, and delays in the provision of applied basic emergency care. There is no protocols or standard of care for dealing with obstetric emergencies existed, and most emergencies were being managed by junior staff **Arab Millennium Development Goals Report (2014)**.

II. Subjects and Methods

2.1 Study aim: The aim of present study was to implement guideline for management of hyperemesis gravidarum .

2.2 Study hypothesis:

Implementing nursing care guideline will reduce the severity of HG and will improve the pregnancy condition

2.3 Study design: A quasi – experimental design, using one arm was carried out between January 2017 till September 2017.

2.4 Study setting and participants:

The study was conducted at Kafer El-Shikh General Hospital, Kafer El-Shikh Governorate, Egypt. Kafer El-Shikh General Hospital is a public hospital provides free services to women during their life cycle such as; antenatal care, labour, postpartum care and family planning services. The outpatient clinic is opened daily from 9 am to 2 pm except Friday. It consists of 4 rooms, two of them for checking women, room for performing ultrasound and the last room for consultation. There are 75 -100 per week case comes for seeking care. The inpatient department is consists of 3 rooms with 18 bed. women who were fulfilled the following inclusion criteria were selected to be included in the study: pregnant woman diagnosed with HG, pregnant women in first trimester and pregnant women with single viable fetus. woman with vesicular mole were excluded.

2.5 Sampling:

A purposive sample of 50 pregnant women were selected according to the following equation, at 5% level of significance & 80% power. The formula of calculating sample size is $n = [(Z_{\alpha/2} + Z_{\beta})^2 \times 2SD^2] / (\mu_1 - \mu_2)$.

2.6 Data collection: To achieve the study aim the following three tools were used:

First tool: Interview Questionnaire Schedule: it consisted of three parts

Part I: General characteristics of pregnant women which include: age, level of education, occupation, residence and phone number, etc.....

Part II- Medical and Obstetric history which include: medical and surgical history, menstrual history, obstetric history, past obstetric complications and current health status .

Part III: Risk factors for Hyperemesis Gravidarum(HG) include: nulliparity, obesity, metabolic disturbances, a history of HG in a previous pregnancy, psychological disorders (for example, eating disorders such as anorexia nervosa or bulimia) .

Second tool: Modified 24-hour Pregnancy-Unique Quantification of Emesis (PUQE) score

It is adapted from (**Ebrahimi, Maltepe ,Bournissen& Koren, 2009**).This questionnaire contains three questions regarding the time-span of nausea, vomiting and retching respectively, as well as one question assessing the wellbeing rating scale.

Third tool: observational check list which consisted of two parts :

Part (I): Royal College of Physicians of Ireland and the Clinical Strategy and Programmes Division, Health Service Executive observational check list. The updated guideline was developed by **Harrington L, Byrne P, O'Reilly M and Cleary B.(2015)**. It was adopted to assess the applied nursing care with routine of hospital care. It include the management of mild, moderate and sever HG. Three items were omitted from the

management of sever NVP which include: Refer to dietitian for assessment of nutritional needs as no dietitian consultation was present in the hospital. Insulin-dependent diabetics must be managed carefully to prevent hypo/hyperglycemia. Apply anti-embolic stockings for women who are bed ridden as no diabetic or bed ridden patient were found in the study sample

Part (II). Follow up sheet

It is used to assess women health after applying nursing care guideline by contacting the woman for nine observations according to their schedule of antenatal visit. It included assessment of: Body Mass Index (BMI), (PUQE) score, Signs & Symptoms of dehydration such as (dry mucous membrane, weight loss, tachycardia), Ultra sound (U/ S) report which include (viability of the fetus, amniotic fluids abnormalities, presence of fetal abnormalities), Life style modification such as (nutrition, fluids, herbal therapy, acupressure, activates).

2.7 Pilot study

The pilot study was carried out on 10% of high risk pregnant (HG) to ascertain the clarity and applicability of the tool. Also, to estimate the time needed to complete each tool, tool I, II and III took 10,10 minutes and (2-4) days respectively according to the health status of the patient and response to the guideline then follow up of the patient until delivery.

2.8 Field work

- The researcher introduced herself to the director of Kafer El-Shikh general hospital and took the approval after explaining the aim of the study. Again the researcher introduced herself and the aim of the study to women to obtain their written informed consent for participation in the study. If the case was mild, she took her guideline about life style modification for HG in the same clinic and then went to home. But if the case was moderate or severe, she transferred to the high risk department for applying the guideline until the sample size was completed. **Firstly**, all women were interviewed for 10 minutes to explain the aim of the study. Each woman was interviewed to collect socio demographic data, history and risk factors. **Secondly**, each woman was interviewed for another 10 minutes to assess their status by using the Modified 24-hour Pregnancy-Unique Quantification of Emesis (PUQE) score. {Mild ≤ 6 , Moderate = 7–12, Severe = 13–15}.

- **Thirdly**, implementation of nursing care guideline was based on assessing severity of HG in which:

1. **Mild cases (PUQE score ≤ 6 and negative ketone urea)** were managed in outpatient unit of Kafer El-Shikh general hospital by: obtaining Urine test for ketonuria and obtain baseline weight/ body mass index (BMI).

Giving an educational session which included (definition of HG, causes, risk factors, complications, management strategies, life style for HG). The session was conducted using posters and Arabic handbook which was given to the women.

The researcher stayed with mild degree of HG for one hour and then the woman take her antiemetic medication and then going home with instruction to seek medical help if there are any health deterioration. Finally, the researcher followed the health status of the woman by telephone call according to the schedule of antenatal visit which was one visit monthly until 28th weeks of pregnancy, then every two weeks until the 36th weeks, then weekly until the 40th week or birth.

2. **Moderate(PUQE score = 7–12) & Sever (PUQE ≥ 13) pregnant women with positive ketone urea** were managed at inpatient high risk department by: applying nursing care guideline in two shifts from (8:00am-8:00 pm) through commence intravenous fluids (sodium chloride 0.9%). Infuse first liter over 1-2 hours and then reassess the woman, including urine ketone testing. Further IV fluids if required should be run at 1000mls over 4 hours, with taking her antiemetic medication as Serotonin antagonists (Zofran) followed by further assessment.

I.V supplementation of Vitamin B6 was given to the woman, while monitoring for potassium level if found less than 3.2mmol/l, potassium supplements should be given. Encouraging oral fluids and dietary intake of small frequent amounts of food if tolerated, and then recording the data. After that in the next day the researcher checked the patient record and complete the necessary data.

The woman hospitalized until the general status was corrected. They were discharged on oral medications only after they met the following criteria: were able to tolerate food and water for 24hours, no ketonuria, no further weight loss, and no emesis for last 24 hours. Before the woman discharged to home the researcher give her an educational session as mentioned before, After that the researcher follow the health status of the woman by telephone call according to the schedule of antenatal visit and complete the follow up sheet. The hospital routine care was done to the women with HG is applying intravenous fluids (ringer or sodium chloride 0.9%) every 8 hours with antiemetic medications (danset or primpran) every 8 hours. Depovit

vitamine B12 every 24 hours while the women were Nothing Per Oral (NPO) for 48 hours, then assess the health status of the woman if she was stabilized she discharged to the home and asked to take her antiemetic medications.

3. After implementing nursing care guideline for HG , the researcher did a monthly call to the woman until 28th weeks of pregnancy, then did a call every two weeks until the 36th weeks, then weekly call until the 40th week or birth, to evaluate her health status through assessing (BMI) , (PUQE) score, signs & symptoms of dehydration, life style modification and evaluate the health status of the fetus through(U/ S) report. If the woman status is deteriorated, the researcher was asked her to attend the outpatient clinic for follow-up and do the necessary management.

2.9 Ethical consideration

- Ethical approval was obtained from the research ethics committee at the faculty of Nursing, Mansoura University to implement the study.
- The purpose of the study was explained to the study subjects and the confidentiality of data was assured.
- The study subjects' written consent to participate in the study was obtained.
- An official letter from Faculty of Nursing, Mansoura University was directed to the director of Obstetrics and Gynecologic Department of Kafer El-Shikh to obtain his official permission to conduct the study after explaining its purpose.
- Prior to enrollment, written consents were obtained from pregnant women involved in the study after clarification the adequate information about the nature and the aim of the study.
- To ensure the confidentiality and anonymity of the participants' information, all were stored securely in the researcher computer files.
- The participant were informed about their rights to refuse participation or withdraw from the study at any time without a penalty.
- All data were only used for the purpose of addressing the research questions and would also be burned on completion of the study.
- The data collection sheet was take code rather than names. This measure ensured the participation not be identified in the public reports.

2.10 Data analysis

All statistical analyses were performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). Continuous data were expressed in mean \pm standard deviation (SD). Categorical data were expressed in number and percentage. Chi-square test was used for comparison of variables with categorical data.

III. Results

Table one shows a highly statistically significant difference ($p = <0.001$) among the studied women regarding signs and symptoms of dehydration between before and after implementing guideline. **Table two** illustrates the duration of intravenous fluids (IV) and hospital stay in days after implementing guideline. The Mean \pm SD was 34.2 ± 6.7 and 2.4 ± 0.7 in duration of intravenous fluids (IV) and hospital stay in days respectively. **Table three shows** there were highly statistically significant difference in nutrition and fluids ($p = <0.001$) life style modification among the study sample observations from the initial observation to the last one during the follow up. On the other hand there were no statistically significant difference in sleeping, acupressure, herbal therapy, activities and stimulus life style modification among the study sample observations from the initial observation to the last one during the follow up.

Table 1. Comparison of signs and symptoms of dehydration & BMI before and after implementing guideline among pregnant women with hyperemesis gravidarum

signs and symptoms of dehydration	Pre		Post		Chi square test	
	No=31	%	No=31	%	X ²	p
Dry mucous membrane	31	100.0	0	0.0	62.000	<0.001
Tachycardia	31	100.0	0	0.0	62.000	<0.001
Weight loss	31	100.0	0	0.0	62.000	<0.001
Postural hypotension	31	100.0	0	0.0	62.000	<0.001
Ptyalism	31	100.0	0	0.0	62.000	<0.001
BMI (kg/m ²)	25.8 \pm 2.8		25.2 \pm 2.8		0.761	0.450

Table two. Duration of intravenous fluids (IV) and hospital stay period after implementing guideline in pregnant women with hyperemesis gravidarum

Duration of iv fluids		No=31	%
<24hrs		8	25.8
24-48hrs		20	64.5
>48hrs		3	9.7
Mean ± SD		34.2 ±6.7	
Duration of hospital stay in days		No=31	%
2		22	70.9
3		6	19.3
4		3	9.8
Mean ± SD		2.4 ±0.7	

Table three. Life style modification for the studied pregnant women after implementing HG guideline during the follow up

	Nutrition				fluids				Sleeping				Herbal therapy				acupressure				activates				stimulus	
	Not used		used		Not used		used		Not used		used		Not used		used		Not used		used		Not used		used			
	N	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
Observation 1	41	82	9	18	31	62	19	38	3	6	47	94	39	78.0	11	22.0	43	86	7	14	1	2.0	49	98.0	50	100
Observation 2	34	68	16	32	22	44	28	56	3	6	47	94	39	78.0	11	22.0	43	86	7	14	1	2.0	49	98.0	50	100
Observation 3	20	40	30	60	11	22	39	78	2	4	48	96	39	78.0	11	22.0	42	84	8	16	1	2.0	49	98.0	50	100
Observation 4	7	14	43	86	7	14	43	86	0	0	50	100	36	72.0	14	28.0	42	84	8	16	2	4.0	48	96.0	50	100
Observation 5	1	2	49	98	3	6	47	94	0	0	50	100	35	70.0	15	30.0	42	84	8	16	2	4.0	48	96.0	50	100
Observation 6	0	0	50	100	2	4	48	96	0	0	50	100	39	78.0	11	22.0	42	84	8	16	1	2.0	49	98.0	50	100
Observation 7	0	0	50	100	2	4	48	96	0	0	50	100	39	78.0	11	22.0	42	84	8	16	1	2.0	49	98.0	50	100
Observation 8	0	0	50	100	1	2	49	98	2	4	48	96	39	78.0	11	22.0	42	84	8	16	1	2.0	49	98.0	50	100
Observation 9	0	0	50	100	1	2	49	98	2	4	48	96	39	78.0	11	22.0	42	84	8	16	1	2.0	49	98.0	50	100
Chi square test																										
X ²	238.894				126.274				10.788				2.172				0.237				1.305		0			
P	<0.001				<0.001				0.214				0.975				0.999				0.995		1.000			

IV. Discussion

This study aimed to apply nursing care guideline for hyperemesis gravidarum. This aim was achieved through study framework, which support research hypothesis which was implementing nursing care guideline will reduce the severity of HG and will improve the pregnancy condition.

The current study showed that there were significant improvement regarding signs and symptoms of dehydration and Body Mass Index(BMI) after implementing guideline, this reflected up on the effect of guideline in solving signs and symptoms of dehydration (dry mucous membrane, tachycardia, weight loss, postural hypotension, ptyalism).

Concerning the duration of hospital stay in days, it was found that near to three quarter of studied pregnant women stayed two days while only one tenth stayed 4 days and mean ± SD was 2.4 ±0.7. These findings were not similar to **Fiaschi, Nelson, Tata (2016)** whom study about hospital admission for hyperemesis gravidarum: a nationwide study of occurrence, reoccurrence and risk factors. They concluded that less than half of study subjects were admitted from two to three days and almost one third of them admitted more than four days. The difference between two results may be due to sample size and duration of collecting the data between two studies. Another cross-sectional study **Segni e al., (2016)** whom study about prevalence of Hyperemesis Gravidarum and associated factors among pregnant women. They indicated that more than two thirds of women had from 1-4 days hospital stay.

In the present study a highly statistically significant difference was found in life style modification regarding nutrition during the follow up from the initial observation to the nine one. This reflected upon the compliance of study subjects to the instructions and health teaching that were given. On the same line, the present study showed normal Body Mass Index (BMI) from initial observation to the last one during the follow up which proved an improvement on the case's condition. These findings are in congruent with **Chortatos, Haugen, Iversen & Veierød (2014)** whom study about dietary changes during first trimester of pregnancy for women with nausea and vomiting in the Norwegian mother and child cohort study. They found that more than half of pregnant women reported NVP. The NVP group of women were the group that was affected with changes in food consumption, having the lowest proportion reported that they were eat as before pregnancy, as

well as the highest proportion reported that they were 'eating more' and 'reduced eating'. The SF group reported that they were eating more than NVP group.

In the present study more than three quarter of studied pregnant women not used herbal therapy as mentioned in guideline for modification of their life style during the follow up from first observation to the last one observation. These results may be due to lack of awareness of the studied pregnant women about complementary therapies rather than medications in treatment of HG. Also, these results may be related to more than one fifth of studied pregnant women had primary level of education, more than three quarter of the pregnant women were house wives and around half of them life in rural areas. As a predisposing factor for not using herbal therapy as mentioned in guideline. This results not supported by **Saberi, Sadat, Abedzadeh-Kalahroudi & Taebi (2016)** whom study about acupressure and ginger to relieve nausea and vomiting in pregnancy. They found that ginger is an effective and inexpensive treatment for nausea and vomiting and is safe.

In relation to acupressure guideline the majority of studied pregnant women not used acupressure therapy as mentioned in guideline for modification of their life style during the follow up from first observation to the last one observation. These findings not similar to **Mansour, Emam, Elghory & Shebl (2015)** they found that difference between the base line improvements in conventional group is significantly better than acupressure group in different days. The rate of improvement compared in P6 acupressure to conventional was less than three quarter percent to hundred percent respectively.

In the present study all of studied pregnant women used avoiding stimulus (smoking, caffeine) as mentioned in guideline for modification of their life style during the follow up from first observation to the last one observation. This may be due to around half of the studied pregnant women educational level ranged between university and secondary school education which increase their awareness about the negative effect and hazards of (smoking, caffeine) in both the mother and fetal wellbeing.

These results is similar to **Chortatos et al., (2015)** who did a study on pregnancy complications and birth outcomes among women experiencing nausea only or nausea and vomiting during pregnancy, they found that there were significantly more non-smokers amongst the NP and NVP women compared with (SF) women, both before pregnancy as well as during.

This is disagreement with **Nasir, Mariyam, Riaz & Munaza, (2016)** whom study about caffeine and women's fertile health. They found that caffeine consumed daily in different forms such as coffee, tea, cola and other beverages act as a plant alkaloid, CNS stimulant and generally recognized as safe drug.

In the current study all of studied pregnant women used the life style modification in activities from first observation to the last one observation during the follow up. These findings may be due to the present study proved that a highly statistically significant difference were found among studied pregnant women wellbeing in (all of the time, most of time and more than half of time) during the follow up. These results are well documented and supported by **Heitmann et al., (2017)** whom study about burden of nausea and vomiting during pregnancy: severe impacts on quality of life, daily life functioning and willingness. They found that NVP greatly interfered with the women's daily lives and have important adverse effects on daily life functioning. Also, severity of NVP was significantly associated with impaired ability to engage in domestic, occupational and social activities, with increased impact according to increased severity. Also, these results are similar to **(Committee Opinion Summary, 2015)** it recommended that guidelines on physical activity or exercise and pregnancy encourage pregnant women to continue or adopt an active lifestyle during and following pregnancy.

V. Conclusion

The results highlighted that there were significant improvement regarding signs and symptoms of dehydration and Body Mass Index (BMI) after implementing guideline. This study clarifies a highly statistically significant difference between before & after implementing guideline regarding (all vital signs, PUQE scoring index, nutritional and fluids intake life style modification during the follow up from the initial observation to the last observation). Finally majority of the study sample used the life style modification toward activities and avoiding stimulus (smoking, caffeine) from first observation to the last one during the follow up.

VI. Recommendations

Based on the study findings, the study is recommending the following:-

- Implementing and distributing nursing care guideline for hyperemesis gravidarum through general antenatal clinic during initial visit of the pregnant women.
- Increase awareness of pregnant women about hazards of nausea and vomiting during pregnancy and necessary of early seeking medical care to avoid deterioration of the case and developing to hyperemesis gravidarum.
- Designing and applying an educational class for the health care provider about how to utilize PQUE scoring index in diagnosis and evaluation of hyperemesis gravidarum at different antenatal clinics.

- Designing and applying an educational class for the health care provider about giving psychological support and reassurance for the women with hyperemesis gravidarum to cope safely with her pregnancy.

Further studies are recommended to:-

- Applying this study on different health care setting and sectors and on a larger scale.

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