
The Effect of Body Mass Index on the Use of Antiemetic Drugs and Hyperemesis Gravidarum Required Hospitalization

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Abstract:

Objectives: To assess whether the pre-pregnancy maternal body mass index (BMI in kg/m²) was associated with the use of antiemetic drugs in early pregnancy and or with hospital admission for hyperemesis gravidarum (HG).

Study design: Prospective observational study.

Patients methods: one hundred and fifty pregnant patients were included in this study, had been seen at their booking visit they were not smoker, at least complete their primary school, know their weight prior to pregnancy, pregnant with singleton viable intrauterine pregnancy. Full history, clinical examination and measurement of their BMI(kg/m²) then divided into four groups. According to WHO classification of BMI patients were four groups: <18.5 kg/m² (under weight), 18.5-24.9kg/m² (normal weight), 25-29.9kg/m² (over weight) ≥30kg/m² (obese). The patients keep on regular follow up, and informed to return once severe nausea and vomiting developed (nvp) that severe required medication and when hospital admission is indicated for hyperemesis gravidarum (HG).

Result: Underweight women were significantly used antiemetic drugs in early pregnancy p value <0.02, relative risk (RR)=1.54 and confidence interval (CI 95%) = 1.05-2.26 and become significantly hospitalized for hyperemesis gravidarum (HG) P value <0.02, with RR = 2.17 and (CI 95%) = 1.10-4.26 compared to ideal weight women. Obese women were significantly used less antiemetic drugs P value <<0.04, RR= 0.49 and CI(95%) =0.24-0.97, and required hospitalization for (HG) less, but not reach the level of significance P value <0.05, RR= 0.14, CI(95%) = 0.018-1.03 compared with ideal weight women. No statistical significant difference was found between over weight women compared with ideal weight women regarding antiemetic drugs used and hospitalization.

Conclusion: The use of anti emetic drugs and HG required hospitalization significantly more in women with under weight.

Key words: BMI, hyper emesis gravid arum, nausea and vomiting of pregnancy.

Introduction

Up to 80% of all pregnant women experience some form of nausea and vomiting during their pregnancy (nvp) [1].

Hyperemesis gravidarum (HG) is a condition of intractable vomiting during pregnancy, leading to fluid, electrolyte and acid-base imbalance, nutrition deficiency and weight loss often severe enough to require hospital admission [1,2].

HG like nvp typically occurs between the 4th and 10th week of pregnancy, with resolution by 10 weeks of gestation. [1], in approximately 10% of HG patients, symptoms will persist through out pregnancy [1].

Estimate of the incidence of HG vary from 0.3% -1.5% of all alive birth, with most authors reporting an incidence of 0.5% [1,2,3].

It is widely believed that the rate varies across different cultures, despite decades of researches the cause of these conditions remains unknown and the relationship between nvp and HG is still unclear. [1]

HG is the most common cause of hospitalization in the first half of pregnancy and the 2nd most common cause of antenatal hospitalization during pregnancy overall, 2nd only to preterm labor [3].

Risk factors reported to be associated with nvp and HG are low maternal age [4], first parity [4], female sex of fetus [5,6,7], twinning [6], smoking while vitamins use in early pregnancy were associated with decrease risk [4,5].

There is some evidence in the literature that eating disorders such as anorexia and bulimia may be more frequent among women with nvp and HG [8]

The possible association between nvp /HG and maternal pre-pregnancy BMI was evaluated in earlier studies, low maternal pre-pregnancy BMI seems to be a risk factor for HG [9,10] and for frequent vomiting [11], but there are also contradictory results that indicate no relationship [12,13].

Patients and method:

This study was extended from July 2009-June 2010; the sample was collected from out patients department of AL-Yermouk teaching hospital and from private clinic.

Initially one hundred and sixty four pregnant ladies were included in this study all of them had been seen at their booking visit and were able to return for regular follow up.

Inclusion criteria;

All pregnant ladies included in this study know their weight prior to pregnancy, not smoker; at least complete their primary school, with no history of medical or endocrine illness (e.g. thyrotoxicosis)

All patients complaining of intractable vomiting and inability to retain food and fluid that not respond to simple measure such as reassurance and dietary changes.

Criteria for admission to hospital:

Severe dehydration (decrease skin turgor, postural changes in blood pressure and pulse and inability to tolerate oral fluid)

Acetone breath, metabolic acidosis

Jaundice not due to other causes e.i hepatitis

Electrolyte abnormality Significant weight loss >5%.

Exclusion criteria;

Twins pregnancy diagnosed during the period of follow up, abnormal pregnancy (mole pregnancy, ectopic pregnancy), any history of medical or endocrine illness and drugs used early in pregnancy.

Full history, complete clinical examination, calculation of BMI in kg/m was done at first visit; ultrasound was performed for confirmation of normal viable singleton intrauterine pregnancy during period of follow up all patients send for the following investigation:

- Serum Na, Cl, K
- General urine exam for ketone and to exclude urinary tract infection
- Complete blood picture
- Liver function test, hepatitis screen when there is an indication.
- Renal function test.
- Thyrotoxicosis was excluded by clinical examination and laboratory investigation when there is clinical indication for it.

According to WHO classification of BMI patients were divided in to four groups : <18.5 kg/m² (under

weight), 18.5-24.9kg/m² (normal weight), 25-29.9kg/m² (over weight) ≥30kg/m² (obese).

Fourteenth patients were excluded from this study because of the following;

Fife patients were lost from follow up ,three patients their pregnancy were ended with miscarriage ,two patients was diagnosed with ectopic pregnancy ,one patient was diagnosed with mole pregnancy and one patient with thyrotoxicosis.

The patients informed to return once nvp developed that required medication or hospital admission.

The anti emetic drugs used include the following:

B6, stemetil (Prochlorperazine), Largactil (Chlorpromazine), cyclizine

Statistical analysis:

Relative risk and confidence interval was used to compare different groups, P < 0.05 considered to be significant.

Results:

One hundred and fifty pregnant ladies were included in this study.

The demographic characters of study groups are shown in table no. 1

Table No.1: Demographic characters of patients included in this study

Age(years)	No. (%)
Below20	68(45.4%)
20-29	38(25.3%)
30-39	44(29.3%)
Level of education	
Primary school	70(46.7%)
2 nd school	44(29.3%)
Higher education	36(24%)
BMI(kg/m ²)	NO (%)
Below18.5kg/m ²	31(20.7%)
18.5-24.9kg/m ²	57(38%)
25-29.9kg/m ²	25(16.7%)
30 and more kg/m ²	35(23.33%)
Parity	
Primigravida	90(60%)
1	43(28.7%)
2	13(8.7%)
3	2(1.3%)
4 and more	2(1.3%)

Regarding the use of anti emetic drugs early in pregnancy:

Twenty one out of thirty one (67.7%) patients with BMI less than 18.5kg/m² (under weight) required

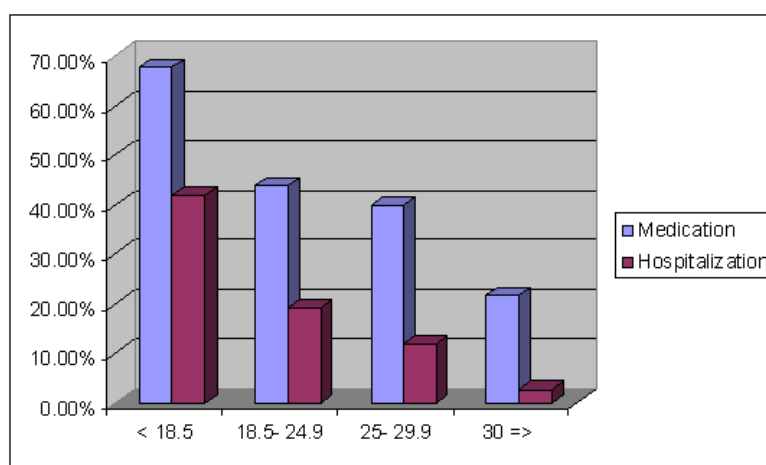
medication for nvp which is significantly high when compared with control group BMI 18.5-24.9 kg/m² (normal weight) with relative risk (RR) =1.54 and P value 0.02 as shown in table no.2

Table no.2: The No. of patients used anti emetic drugs in early pregnancy in relation to pre-pregnancy BMI class

Pre-pregnancy maternal BMI	Total no. of patients with in each BMI class	No. and % of patients used anti emetics drugs in each BMI class	Relative risk RR	Confidence interval 95%(CI)	P value
Below 18.5kg/m ²	31	21(67.7%)	1.54	1.05-2.26	0.02
18.5-24.9 kg/m ²	57	25(43.8%)	1		
25-29.9 kg/m ²	25	10(40%)	0.91	0.51-1.6	0.7
30 and more kg/m ²	37	8((21.6%)	0.49	0.24-0.97	0.04

In obese group of patients BMI ≥ 30 kg/m², only eight out of thirty seven patients (21.6%) used anti emetic drugs early in pregnancy which is significant

lower when compared with normal weight group, with relative risk (RR)=0.49 P value < 0.04 as shown in table no.2,figure no.1.

**Figure No.1: Percentage of patients in each BMI class required medication and hospitalization.**

There is significantly higher no. of under weight patients thirteen out of thirty one (41.9%) required hospital admission for HG compared to controlled group with p value <0.02 and lower no. of

obese patients one out of thirty seven (2.7%) required hospitalization when compared with control group but not reach the level of significance with P value <0.05as shown in table no.3

Table no.3: The No. of patients who were hospitalized for hyperemesis gravidarum according to each pre-pregnancy maternal BMI class

BMI class	Total no. of patients with in each BMI class	No. of patients required hospitalization and % for each BMI class	Relative risk (RR)	Confidence interval 95%(CI)	P value
Below18.5 kg/m ²	31	13(41.9%)	2.17	1.1-4.24	0.02
18.5-24.9 kg/m ²	57	11(19.2%)	1		
25-29.9 kg/m ²	25	3(12%)	0.62	0.18-2.03	0.4
30 and more kg/m ²	37	1(2.7%)	0.14	0.018-1.03	0.05

No significant differences were found between control group and over weight group regarding use of antiemetic drugs and hospital admission for HG. As shown in table No2 & 3 respectively.

Discussion:

This study showed that women with lean body composition had an increased risk of antiemetic drugs used in early pregnancy when compared with women with ideal weight.

Same result was obtained by Marie cedergren et al and Kallen B et al^[14,15].

The obese women had reduced risk for exposure to antiemetic drugs in early pregnancy compared with ideal weight women in agreement with others^[15].

Regarding hospital admission for HG:

In this study women with under weight were hospitalized significantly more often because of HG

compared with ideal weight women, this result comparable with a result of retrospective study Rochelson B. et al on 38 hospitalized women concluded that low pre-pregnancy weight predisposed women to develop HG^[9] and, in agreement with another study done by Demir B. et al compared between pregnant women with HG and pregnant women without HG^[10].

We can only speculate about the reason that obesity is a protective factor against the development of HG and the use of antiemetic drugs in early pregnancy.

One explanation could be the difference in the body composition with large fat deposited that neutralizes the circulating placental factors that are thought to play a role in HG^[16,17].

It is also possible that lean women with nvp and HG receive more care from the physician in the form of medication and hospitalization than do obese women because of differential concern regarding adequate maternal and fetal nutrition.

Our result disagree with a study from Canada^[5] where no association between maternal BMI and HG, could be explained by the use of maternal weight instead of maternal pre-pregnancy BMI^[5].

No significant difference was found when compared the ideal weight with over weight pregnant ladies regarding the use of antiemetic and hospital admission for HG in agreement with others^[15].

Conclusion:

Under weight women had an increased risk for use of antiemetic drugs and for hospital admission for HG compared with normal weight.

No significant association was seen among overweight women,

The risk was decreased among obese women.

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