

An Investigation into the Nutritional Intakes of Women with Hyperemesis Gravidarum in Relation to Gestational Age and PUQE Score

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Introduction

- Hyperemesis Gravidarum (HG) is characterised by extreme nausea and vomiting of pregnancy (NVP)¹ which can lead to electrolyte imbalances, nutritional deficiencies, dehydration, foetal growth restriction, and increased morbidity/mortality².
- HG has been reported to occur in 0.3-10.8% of women¹.
- Diagnosis of HG is confirmed by exclusion and the severity of HG is assessed using the Modified 24-hour PUQE (Pregnancy Unique Quantification of Emesis and Nausea) score³.
- There is a paucity of research on the dietary intakes of women with HG, with no studies that examine intakes across all trimesters of pregnancy, as well as the impact of the severity of symptoms on intakes.

Aims

To investigate whether a relationship exists between nutritional intake, gestational age, and The PUQE score in patients with HG.

PUQE form:

Pregnancy-Unique Quantification of Emesis and nausea

Circle the answer that suit the best your situation for the last 24 hours.

1. On average in a day, for how long do you feel nauseated or sick to your stomach?

> 6 hours 5 points	4-6 hours 4 points	2-3 hours 3 points	≤1 hour 2 points	Not at all 1 point
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2. On average in a day, how many times do you vomit or throw up?

≥7 times 5 points	5-6 times 4 points	3-4 times 3 points	1-2 times 2 points	Not at all 1 point
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3. On average in a day, how many times have you had retching or dry heaves without bringing anything up?

≥7 times 5 points	5-6 times 4 points	3-4 times 3 points	1-2 times 2 points	Not at all 1 point
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Total score (sum of replies to 1, 2, and 3): mild NVP ≤6; moderate NVP, 7-12; severe NVP ≥13.

Quality of life question:

On a scale of 0 to 10, how would you rate your well-being: _____
 0 (worst possible) 10 (As good as you felt before pregnancy)

Methodology

- Quantitative observational cross-sectional study
- 93 female participants collected by The Rotunda Hospital (RH)(n=36) and The National Maternity Hospital (NMH)(n=57)
- Trimester 1 = <13 weeks, 13-26 weeks = Trimester 2, Trimester 3 = >26 weeks gestation

- To obtain nutrient intake information, a Food and Fluid Diary was used by the RH, and a 24-hour recall was used by the NMH
- The Modified 24-hour PUQE score was applied to both questionnaires
- The PUQE score = three categories: mild (<6), moderate (7-12), and severe (>13)³

- Nutritics Software version 5.7 used to calculate nutrient intake
- Statistical Analysis-SPSS Software Version 28
- Normality and Descriptive Tests, One-way Anova Tests, Post-Hoc Bonferroni Tests

Results

Figure 1.- PUQE Category Cases (N) per Trimesters

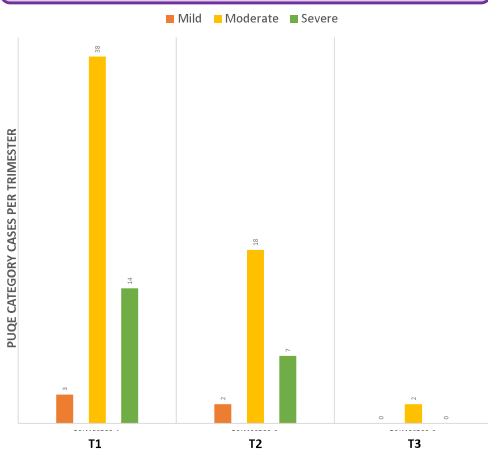


Table 1.- Mean (SD) intake of nutrients in at Trimester 1, Trimester 2 and Trimester 3.

	Trimester 1	Trimester 2	Trimester 3	P Value *
Energy (kcal)	966 (550)	1008 (431)	1019 (256)	.923
Protein (g)	40.88 (27.38)	37.66(20.76)	23.95 (2.99)	.487
Carbohydrates (g)	120.56 (65.04)	132.66 (57.85)	131.83 (44.09)	.694
Fat (g)	35.71 (20.85)	36.39 (21.17)	43.76 (10.99)	.805
Water (g)	934.56 (774.85)	771.06 (419.29)	1426.2 (758.63)	.255
Saturated Fat (g)	15.17 (9.60)	14.35 (8.93)	21.13 (8.22)	.499
Calcium (mg)	432.32 (302.32)	499.25 (379.46)	393.53 (229.97)	.645
Vitamin K 1 (ug)	13.07 (30.44)	12.68 (23.45)	7.73 (6.31)	.950
Vitamin C (mg)	47.09 (51.79)	65.78 (76.21)	80.53 (107.91)	.316
Caffeine (mg)	23.06 (43.77)	11.92 (24.55)	61.52 (102.63)	.128

Table 2.- Mean (SD) intake of each nutrient at each PUQE Category (Mild, Moderate, Severe)

	Mild	Moderate	Severe	P value*
Energy (kcal)	1261 (265)	1012 (477)	812 (423)	0.087
Protein (g)	64.36 (27.34)	38.83 (22.04)	32.66 (27.73)	0.033*
Saturated Fat (g)	24.72 (6.27)	15.05 (9.71)	13.41 (7.80)	0.05*
Zinc (mg)	6.92 (7.51)	3.87 (2.34)	2.95 (2.06)	0.019*
Iodine (ug)	52.80 (36.07)	66.48 (58.48)	58.85 (81.53)	0.83
Vitamin D (ug)	1.11 (.749)	1.33 (1.76)	2.31 (4.72)	0.358
Vitamin E (mg)	3.16 (2.06)	3.36 (3.12)	4.03 (4.87)	0.749
Folates (B9) (ug)	137.95 (69.17)	126.82 (78.90)	146.42 (121.47)	0.693
Vitamin C (mg)	43.57 (36.87)	51.06 (56.76)	60.53 (77.56)	0.785

Discussion

- The results of the study support the hypothesis that symptoms of HG are more severe within the first three months of pregnancy¹.
- There were significant associations found between PUQE score and Protein, Saturated Fat, and Zinc.
- Results regarding nutrient intakes are similar to those in previously published studies⁴ which suggests that as patients' symptoms worsen, their energy intakes decrease.
- Nutrient intakes did not meet the recommended intakes set by the FSAI, particularly in terms of energy consumption. Interestingly, the intakes of Vitamin C in the third trimester were the only nutrient to narrowly meet the recommended intake.
- The results of this study indicate the need for further research to determine if there is an association between, not only the nutritional intake of women with HG and PUQE score, but also if gestational age plays a role in nutritional intake.

Conclusion

- No significant associations between dietary intakes of patients with HG gestational age (trimesters) were found. However, the results show a significant relationship between the nutritional intakes of certain nutrients, including Protein, Zinc, Saturated Fat, and PUQE category.
- Further research into how HG influences nutritional intake is needed for more targeted assessments and treatment advice in clinical practice.
- The results will help to establish what nutrients need supplementation in the diets of HG patients. This can be added to the current Public Health Guidelines on HG which lack information on nutritional advice.

References

- Fejzo MS, Trovik I, Grooten H, Sridharan K, Roseboom TJ, Vikanes A *et al.* Nausea and vomiting of pregnancy and hyperemesis gravidarum. *Nat Rev Dis Primers* 2019; 5: doi:10.1038/s41572-019-0110-3.
- Fejzo MS, Poursarif B, Korst LM, Munch S, MacGibbon KW, Romero R *et al.* Symptoms and pregnancy outcomes associated with extreme weight loss among women with hyperemesis gravidarum. *J Womens Health (Larchmt)* 2009; 18: 1981-7.
- CLINICAL PRACTICE GUIDELINE HYPEREMESIS AND NAUSEA/VOMITING IN PREGNANCY Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland and the Clinical Strategy and Programmes Division, Health Service Executive.
- van Stuijvenberg ME, Schabert I, Labadarios D, Nel JJ. The nutritional status and treatment of patients with hyperemesis gravidarum. *Am J Obstet Gynecol* 1995; 172: 1585-91.