

# Nutritional Issues of Hyperemesis Gravidarum



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### The patient

A 29-year-old (gravida 3, para 2), who prior to pregnancy was well, was admitted to the Maternity Ward at Frimley Park Hospital with normal singleton intrauterine pregnancy. Her medical history included anorexia nervosa at age of 14 years and epilepsy, with no seizures for over two years. Her weight at the start of pregnancy was 52 kg, body mass index (BMI) 21 kg/m<sup>2</sup>. The patient was diagnosed with hyperemesis gravidarum (HG) at seven weeks gestation.

### The case

During pregnancy, the patient had numerous attendances to the Day Assessment Unit (7, 18, 24 weeks gestation) and one other admission into the hospital, at 15 weeks gestation, for weight loss of 6%, deranged biochemistry and vomiting. At this time, the patient was referred to the dietitians due to weight loss in pregnancy. As a result of a nutritional assessment she was started on a high energy, high protein, ready-to-drink milkshake-style oral nutritional supplement (Fortisip Compact Protein), and advice and encouragement were provided. During her in-patient stay the patient was reviewed again on two occasions by the dietitian, with monitoring of bloods for refeeding syndrome, bowel management, supplement tolerance and oral intake. Her nausea and vomiting settled, and she was discharged from hospital after five days. On discharge, oral nutritional supplements (ONS) were provided, along with a letter to the patient's GP stating that ONS should continue to be prescribed for one month.

The patient was, once again, referred to the dietitians at 33 weeks gestation. The patient had been admitted onto the Maternity Ward due to continued intractable hyperemesis and ketones in her urine. Obstetrically steroids were started for foetal lung maturity. The foetus was small for gestational age. The patient's weight had dropped to 49.5 kg (a loss of 2.5 kg) and she had now suffered with vomiting for 29 weeks. During that time, she had not managed a meal and her main dietary intake was biscuits and crackers. She had continued to take the ONS prescribed by her GP. On consultation with the patient, she appeared pale, fatigued, tearful, anxious and

did not look pregnant. Enteral feeding via a nasojejunal tube (NJ) was recommended and consented to. The following day, NJ tube placement was attempted at the patient's bedside by the nutrition specialist nurse but, unfortunately, this failed due to resistance at the pylorus and the patient complained of abdominal pain. An NJ tube was then placed endoscopically the next day.

Unfortunately, the NJ tube was vomited out the day after placement before feeding was started. The obstetrician and gastroenterologist were informed, and they recommended the patient should be parenterally feeding via a central line (peripheral feeding was not appropriate due to the patient's very poor access). On the fourth day of admission, placement of a peripherally inserted central catheter (PICC) line was unsuccessful due to late referral to the IV specialist nurse, and radiology were unable to place. The patient was left with oral nutrition support measures over the weekend.

On Monday (seventh day of admission), the patient, now 34 weeks gestation, had declined parenteral feeding, gained weight (51.8 kg) and was now mobile and able to walk off the ward. The patient reported that her appetite had significantly improved, was taking nutritional supplements well and keeping a food diary showing a significant increase in oral intake. The patient felt that when hearing from the obstetrician that herself and/or baby were at risk of not surviving, it was a turning point for her, coupled with better anti-emetic control. Encouragement of oral intake was provided by the Dietitian and the patient's mood was significantly improved. The patient asked to go home due to the fact that her husband had fractured his wrist.

On day nine of the patient's hospital admission, her husband highlighted to midwives that his wife had developed a pressure sore (grade 2) on her sacrum – the patient was too 'ashamed' to report this herself. The patient's protein requirements were calculated at 57 g per day. The patient was prescribed a high energy, high protein ONS three times daily (total 54 g protein). The patient was also trialled on ProSource but was non-compliant.

The patient carried on eating with variable appetite and some nausea until 36 weeks gestation, at which point a baby boy (weight 2.07 kg) was delivered via induced vaginal delivery. The baby spent four days on the neonatal unit, after which both mother and child were discharged. The patient was advised to continue the high energy, high protein ONS postnatally, and a dietetic telephone review was arranged. The patient failed to respond to telephone calls and letter from the dietitian.

## What is hyperemesis gravidarum?

Hyperemesis gravidarum (HG), excessive nausea and vomiting, is a miserable condition which needs differentiating from nausea and vomiting in pregnancy (also known as morning sickness). See **Table One**.

HG has no international definition. The Royal College of Obstetricians and Gynaecologists (RCOG) define HG as *'the severe form of nausea and vomiting in pregnancy, which affects about 0.3–3.6% of pregnant women'* and *'typically starts between the fourth and seventh weeks of gestation, peaks at approximately the ninth week and resolves by the 20th week in 90% of women'*.<sup>2</sup>

Severity of HG can be classified via the Pregnancy-Unique Quantification of Emesis (PUQE) score. This is used to determine whether the nausea and vomiting is mild/moderate/severe and can be used to track progress with treatment – see **Table Two**.

Diagnosis of HG is protracted: a weight loss of more than 5% pre-pregnancy weight and clinically present with dehydration, electrolyte imbalances, hypernatraemia, hypokalaemia and ketonuria (amongst others).<sup>2</sup>

Most women do not require hospital admission and are managed in the community. Admission to hospital is required when the patient cannot tolerate oral anti-emetics and/or oral fluids. It can be necessary for some patients to have recurrent day hospital admissions and these may lead to admittance onto the

maternity ward. In-patient admission is required when complications such as electrolyte derangement and compromised nutritional status occur.<sup>2</sup>

The cause of HG is poorly understood, despite research. It is believed there is a hereditary link, for instance, mother, aunt and grandmother may well have suffered.<sup>3</sup>

## Refeeding syndrome

HG is considered to be a common condition associated with refeeding syndrome.<sup>4</sup>

Wernicke's encephalopathy (a serious neurologic disorder caused by thiamine deficiency) may occur, due to poor preparation and management of refeeding syndrome. RCOG endorse thiamine supplementation for all women with protracted vomiting.<sup>2</sup>

Refeeding syndrome has been reported after enteral feeding in a patient with HG. With correction of biochemistry, and the IV administration of B and C vitamins, the patient improved with no long-lasting effect.<sup>5</sup>

## Ketones

The foetus receives energy from maternal sources, which is required for new tissue growth, build-up of energy stores and metabolism.<sup>6</sup> Due to the ethical considerations, there is little known about the effect of ketones in pregnancy. If maternal fasting occurs the fine balance with the foetus is disturbed. Starvation ketoacidosis in pregnancy has been reported in only a few cases and is usually triggered by a period of vomiting. The combination of (mild) starvation and a state of insulin resistance may easily lead to metabolism from alternative sources (fatty acids), leading to the overproduction of ketones ( $\beta$ -hydroxybutyrate, acetoacetate, and acetone) and, consequently, ketoacidosis.<sup>7,8</sup> Glucose used by the foetus lowers glucose levels further. Maternal glycogen stores only allow for energy needs to be met for 24 hours. Furthermore, with less maternal glucose, the foetus can't mobilise glycogen and will use ketones as an energy source.<sup>9</sup>

**Table One: The Difference Between Pregnancy Sickness and Hyperemesis Gravidarum<sup>1</sup>**

Pregnancy sickness	Hyperemesis gravidarum
<ul style="list-style-type: none"> <li>• Little or no weight loss</li> <li>• Infrequent vomiting</li> <li>• Nausea and vomiting do not interfere with daily life and ability to eat and drink</li> <li>• Improved by diet and lifestyle changes</li> <li>• Improves gradually throughout first trimester</li> <li>• Can continue to work most days and care for family</li> </ul>	<ul style="list-style-type: none"> <li>• Over 5% of pre-pregnancy weight loss</li> <li>• Nausea and vomiting causes poor oral intake and dehydration</li> <li>• Frequent vomiting</li> <li>• Require intravenous hydration and medications</li> <li>• Can feel better by mid-pregnancy, or may continue for the duration of pregnancy</li> <li>• Can be off work for weeks/months and may need help to look after self</li> </ul>

**Table Two: Pregnancy-Unique Quantification of Emesis (PUQE) Index<sup>2</sup>**

	Not at all (1)	1 hour or less (2)	2-3 hours (3)	4-6 hours (4)	More than 6 hours (5)
In the last 24 hours, for how long have you felt nauseated or sick to your stomach?					
In the last 24 hours have you vomited or thrown up?	7 or more times (5)	5-6 times (4)	3-4 times (3)	1-2 times (2)	I did not throw up (1)
In the last 24 hours how, many times have you had retching or dry heaves without bringing anything up?	No time (1)	1-2 times (2)	3-4 times (3)	5-6 times (4)	7 or more times (5)

PUQE 24 score: Mild  $\leq 6$ ; Moderate 7-12; Severe 13-15

“HG is considered to be a common condition associated with refeeding syndrome.<sup>4</sup>”

## Starvation and malnutrition in pregnancy

The RCOG states that more than 5% pre-pregnancy weight loss is significant.<sup>2</sup> It is unethical to conduct trials so, therefore, we are reliant on observational studies. The first meaningful evidence came to light following the Dutch Famine of 1944-45. An oral intake as little as 400-800 calories a day resulted in maternal malnutrition, which lasted for five to six months.<sup>10</sup> Observations found the long-term effects included: significantly smaller adult head circumference, altered cognitive function as an adult, and schizophrenia and schizoid personality disorder.<sup>10</sup> Those who were exposed to the famine during late gestation were born small and continued to be small throughout their lives.<sup>11</sup> Further studies have found that when foetuses are exposed to maternal malnutrition during early gestation, it results in the escalation of ageing and double the rate of coronary heart disease.<sup>12</sup>

## Psychological effect of HG

In the case presented within this article, the patient had suffered a merciless 29 weeks of nausea and vomiting, which could be violent, painful and unpredictable, and sometimes so severe that uncontrolled urination occurred. Women can become socially isolated as they become fatigued and housebound, unable to care for themselves and their family. Friction can also occur in relationships. Women may be unable to work, resulting in a loss of earnings, there may be discussions of termination of pregnancy, feelings of guilt and being told to just “put up with it”. The national UK charity Pregnancy Sickness Support gives an explanation on the effects of HG on mental health. A significant conclusion is that psychological factors do not cause HG. HG can result in depression and anxiety, which can continue into the post natal period. Practical and emotional support should be provided to those with HG.<sup>13</sup>

## Learning points

This was a complex and complicated case of intractable HG which provided multiple

hurdles. My ‘light-bulb’ moment was the eradication of the thought ‘*why can’t she just hold her nose and drink the supplement*’, when I didn’t appreciate and understand the psychological effects that continuous weeks of nausea and vomiting can cause. For the patient, it had resulted in the fear of food and fluids, coupled with guilt, and physical and emotional fatigue.

Nutritional support, especially escalation to enteral or parenteral feeding, needs to be considered earlier than 33 weeks gestation. For this patient it was too late and opportunities were missed.

It was initially thought that her previous medical history of an eating disorder was the cause of her prolonged HG. This was not the case.

A better understanding of the triggers a HG sufferer may experience is helpful. These are endless and, for example, can include: the sight of the sun, watching TV, smells, such as deodorant and body wash, sex, moving and brushing teeth.

The side effects of medication (e.g. headaches, panic attacks, nervousness, psychosis, constipation, restlessness and muscle cramps) need to be reviewed in such cases.

Ginger does not work on this patient group as an anti-emetic; in fact, women feel upset, demoralised, disbelieved when this is recommended.<sup>14</sup>

## Conclusion

Women presenting with severe intractable HG need a multi-disciplinary and holistic approach to their care, provided with empathy, and sympathetic to the impacts this condition has on a woman’s physical, emotional and mental health. Many feel unheard, ignored and not taken seriously. They need support. There needs to be a greater understanding of the difference between ‘*morning sickness*’ and HG. Early (and aggressive) nutritional intervention should be considered (and provided appropriately) to prevent significant weight loss and to secure a good pregnancy outcome.

Pregnancy Sickness Support has numerous resources available for both the sufferer and health professionals.

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