THE NORTHERN HOSPITAL

HYPEREMESIS GRAVIDARUM

"The Gallery of HMS Calcutta", oil on canvas, c.1877, James Jacques Tissot, Tate Gallery, London

"The situation in which the magistrates sent the women on board the Lady Penrhyn, stamps them with infamy – tho' almost naked, and so very filthy, that nothing but clothing them could have prevented them from perishing, and which could not be done in time to prevent a fever, which is still on board that ship, and where there are many venereal complaints, that must spread in spite of every precaution I may take hereafter"

Captain Arthur Phillip March 18, 1787,
(in Robert Hughes, The Fatal Shore).

"Seeing a cabin standing somewhat by itself in a hollow, and surrounded by a moat of green filth, we entered it with some difficulty, and found a single child about 3 years old, with its little face resting on the edge of the board and looking steadfastly out at the door as if for its mother. It never moved its eyes as we entered, but kept them fixed towards the entrance. It is doubtful whether the poor thing had a mother or father left to her; but it is more doubtful still whether those eyes would have relaxed their vacant gaze if both of them had entered at once with anything that could tempt the palate in their hands. No words can describe this peculiar appearance of the famished children. Never have I seen such bright, blue, clear eyes looking so steadfastly at nothing"

"Victims of the Great Hunger," Elihu Burritt, Casltehaven 22 February 1847
(in the Faber Book of Reportage)

"One scene I witnessed in the morning of my boyhood which left upon my memory an impression that can never be effaced. That scene was the departure of an immigrant ship from the quay of my native city of Waterford…On the deck of the ship were huddled hundreds of men, women and children – the sons and daughters of Innisfail – sorrow stricken, and yet hopeful and heroic fugitives from the island that gave them birth…Young as I was, I had heard enough of the cruelty that had for years and years, been done to Ireland, to know that her people were leaving her not from choice but from compulsion; that it was not the sterility of the soil, or any other unfavorable dispensation of nature, but the malignant hostility of laws and practices, devised and enforced for the political subjugation of the country, which compelled them to leave"

Thomas Francis Meagher, 1865
(Irish born escaped convict from Van Dieman's Land and American Union General).
(in Thomas Keneally, The Great Shame)

One of history's greatest diasporas came from a nation with barely 8 million people. On a total number combined with percentage on per capita basis it was probably the greatest emigration of an ethnic group of people in history. One of the greatest - and one of the most tragic. Whilst the home country suffered terribly, its peoples helped build new nations and immeasurably enriched them in the process. Today, by some estimates, over 100 million people throughout the "English speaking world" now claim descent from these desperate emigrants.

In 1845 Ireland was a relatively prosperous land of about 8 million people, but it was poised on the threshold of Malthusian tragedy that by century's end would see its population roughly halved. Around a million people had emigrated from the period of 1800 to 1845, but this was nothing compared to the rate that what was to follow. Five million people would disappear from the island, either by dying of starvation during the "Great Hunger" or by emigration to the emerging English speaking nations of the New World, the USA, (New York City in particular) Canada, Australia, New Zealand and South Africa.

With the loss of the American colonies in 1783, Britain looked to the vast empty Southern continent of New South Wales and Van Diemen's Land for a place to rid itself of its criminal classes. Transportation to the American colonies was not a big affair, but with the Great Southern Land, it was renewed on an "industrial" scale. Nineteenth century Britain had become a class based society. These classes were based purely on wealth, derived from its vast Empire. Anyone who had wealth, (no matter what type of character they possessed) were considered to

be of the "first quality", anyone who did not, were of the "lowest". There appeared to be no concept of "opportunity" – the poor had no money, because they were worthless individuals, and deserved to be poor. Opportunity or merit quite simply did not register in the cultural psyche of the day. A philosophy developed during the course of the Nineteenth century that Britain could improve its "genetic stock" by getting rid of its criminal class, which of course to them generally meant the poor and those who could not look after themselves and of this group the largest in the British Isles were the Irish. Transportation to Australia of the "criminal classes" proceeded apace! One hundred and sixty thousand of the "criminal class" would be transported to the harsh untamed continent on the other side of the world. But this emigration was to prove minuscule in with respect to the events triggered by the year of the Great Hunger.

Thomas Malthus, a British intellectual of the day, had put a damper on the then widespread philosophy of the ability of an "advanced" society for unlimited progress, a philosophy not surprising if you happened to be upper class British at that time, with the seemingly unlimited resources of Empire. There was no concept of "consequences" however for this "progress". Malthus however thought of one and "spoilt the party". In his own words, "The power of population is indefinitely greater than the power in the Earth to produce subsistence for man". In other words, as the population in countries soared throughout the early Nineteenth century, Malthus became increasingly anxious about the ability of agriculture to sustain it. In fact his writings had a profound effect on the thinking of an obscure biologist, unknown to the world at that time, by the name Charles Darwin! Most simply dismissed Malthus' ideas as mere "scare mongering". But in 1845 came the Great Hunger. A fungal blight severely affected the potato crops of that year, and as this was the principal staple diet of the poor starvation quickly followed. It is estimated that over one million people starved, millions more would be forced to migrate to the lands of the "New World". Famine also bred disease and long sea journeys together with the immensely crowed conditions on the transport ships, ensured that infectious disease would take a horrific toll. In 1847 an estimated one in five emigrants to Canada died at sea of infectious diseases such as typhus.

By the 1870s transportation to Australia had ceased, and the great famine had passed, yet the Irish emigration continued unabated at this time for another reason. As the escaped convict from Van Diemen's Land, and later American Civil War general Thomas Francis Meagher put it, "it was not the sterility of the soil, or any other unfavorable dispensation of nature, but the malignant hostility of laws and practices, devised and enforced for the political subjugation of the country, which compelled them to leave". The political and cultural subjugation of Ireland by Britain remained brutal and many, even of the "better classes" would emigrate looking for greater freedom and opportunity for themselves and their children. Fortunately by this time sea voyages across the globe were very much safer affairs than they had been earlier in the century. Fast steam ships meant less time at sea and vastly improved medical knowledge and sanitation drastically reduced the death rates on these later Nineteenth century voyages.

This however was not to say that the sea journey was still not an arduous undertaking. Sea sickness that lasted for months remained a significant source of misery, especially for those women who were pregnant and had morning sickness to boot! In distinction to the desperate women of the convict or famine ships, who had to literally live amongst their own vomit, at least these women of "high quality" could go up to the foredecks and directly "heave" over the deck under the discrete cover of a well placed fan! Fortunately in the 21st century, even the fan may not be required on a sea voyage, due to an impressive array of modern anti-nausea medications.

HYPEREMESIS GRAVIDARUM

Introduction

Hyperemesis gravidarum consists of:

- Persistent severe nausea and vomiting
- Before 20 weeks
- Ketosis
- Weight loss, (>5% of pre-pregnant weight)

Hyperemesis gravidarum affects about **1% of pregnancies**, compared to the much more common occurrence of "morning sickness" (milder nausea and vomiting) which occurs in up to 70% of pregnancies.

Pathophysiology

Vomiting in pregnancy is related to the effects of human chorionic gonadotrophin produced by the placenta.

The nausea and vomiting associated with pregnancy:

- Almost always begins by **9-10 weeks** of gestation.
- Peaks at **11-13** weeks.
- Resolves (in the majority of cases) by **12-14 weeks.**
- May continue beyond 20-22 weeks and in some cases, until delivery, in up to 10% of pregnancies.

Despite the label "morning sickness", symptoms are *not* confined to the morning.

Hyperemesis gravidarum is severe and intractable nausea and vomiting in pregnancy as defined above.

Causes:

1. Idiopathic.
2. Hyper-placentosis
    - Multiple pregnancy
    - Diabetes

- Rhesus Isoimmunization.

3. Hydatidiform mole

4. Less commonly, UTI, Hepatitis

Complications:

Vomiting in **late** pregnancy is more significant and may indicate other complications of pregnancy.

Complications include:

1. Dehydration

   Severe vomiting can result in more rapid deterioration of pregnant patients than compared with non pregnant patients, particularly in late pregnancy.

2. Electrolyte abnormalities.

3. Mallory-Weiss tears

4. Gastric acid reflux with oesophagitis.

5. Wernicke's encephalopathy, in severe cases, without thiamine supplementation.

6. Patients with hyperemesis gravidarum often demonstrate abnormalities of liver enzymes. The reason for this is uncertain

Clinical Assessment

Assess the degree of dehydration.

Hyperemesis gravidarum is a diagnosis of exclusion. It is important to consider and rule out other possible causes of vomiting such as bowel obstruction.

Mild/moderate

- Vomiting twice or more per day
- Ketones 1 +
- Requires anti-emetics

Severe

- Vomiting twice or more per day

- Ketones 2 + or more
- Requiring IV rehydration
- Weight loss.

Investigations

Blood tests:

1. FBE
2. U&Es / glucose
3. LFTs.
    - Elevated transaminase levels may occur in as many as 50% of patients with hyperemesis. (Other causes for elevated liver enzymes should also be kept in mind, however)
4. TSH:
    - Hyperemesis is associated with hyperthyroidism and suppressed TSH levels in 50-60% of cases.
5. BHCG
    - If excessively high consider multiple pregnancy or hydatidiform mole.

Urine:

MSU for M&C, to exclude UTI

FWT to test for the presence of Ketones

Ultrasound:

Consider an ultrasound to evaluate for:

- Multiple pregnancy
- Trophoblastic disease

Management

1. IV fluid rehydration.

- Give as clinically indicated

2. Electrolyte disturbances:

   - Correct any hypokalemia is required

3. Antiemetic therapy:

   Mild symptoms:

   Milder symptoms may be controlled with oral medication.

   Options include: [1]

   - **Pyridoxine** (vitamin B6)

     50mg orally up to four times a day or 200mg orally at night.

   If symptoms not controlled add

   - **Doxylamine** (a H1 antagonist), (category A) [2]

     12.5 mg orally nocte, increase to 25 mg nocte then add 12.5mg mane and afternoon as required.

   If symptoms not controlled add another sedating antihistamine:

   - **Promethazine** (Phenergan) (category C) [2]

     10 to 25mg orally three to four times a day

   Or

   - **Dimenhydrinate** (Dramamine), (category A) [2]

     50 mg orally three to four times a day.

   If still not improving add either:

   - **Metoclopramide** (category A) [2]

     10 mg orally three times a day.

     Note that latest recommendations now limit the daily dosage to **30 mg** and the duration of dosage to **5 days.** [3]

   Or

- **Prochlorperazine** (category C)

  5 to 10 mg orally two to three times a day *or* 25mg PR once to twice a day.

Moderate to severe symptoms:

- **Ondansetron** (Zofran) (category B1) [2]

  4 mg orally b.d or tds.

  4 mg IV/IM every 8-12 hours.

Or

- **Metoclopramide** (category A

  10mg IV/IM every 8 hours.

Or

- **Prochlorperazine**

  12.5 mg IM every 8 hours.

Or

- **Promethazine**

  12.5 -25 mg IM every 4-6 hours.

Or

- **Chlorpromazine** (category C) [2]

  25-50 mg IV/IM every 6-8 hours, (maximum 75 mg daily)

An ultimate option also includes oral steroids, **but these should only be prescribed in consultation with the Obstetric unit.**

4. Antacids:

Some cases may be associated with distressing **reflux** and **oesophagitis symptoms.**

Simple antacids, (e.g. Mylanta, Gaviscon)

- These are considered as first line therapy.

Ranitidine:

- This H2-receptor antagonist is classified as a category B1 drug with respect to pregnancy.

  It is safe for use in pregnancy, and is generally used as second line therapy after antacids.

Omeprazole:

- Most proton pump inhibitors (PPIs) are listed by the Therapeutic Goods Administration (TGA) as category B3 agents with respect to pregnancy, and as such are considered third line therapy after antacids and H2 antagonists.

  Observational studies have not indicated any increased risk of adverse pregnancy outcomes with PPI use.

  If a woman is taking a PPI and is planning pregnancy, consider switching to an H2-receptor antagonists, or trialling on-demand PPI therapy, at least for the first trimester.

  If a PPI is required during pregnancy, the greatest clinical experience is with **omeprazole.**

5. Thiamine

- Consider thiamine in severe cases, (100 mg orally daily) to prevent the possible complication of Wernicke's encephalopathy.

Continue treatment until patient can tolerate oral fluids and urine shows little or no ketones.

Disposition

In milder cases IV rehydration in the ED over several hours may be tried with reassessment after this.

If the patient is then well and the vomiting has settled the patient may be discharged with an early review by their General Practitioner

In more significant cases of vomiting the patient will require admission.

If the patient requires admission but is not too unwell, an SSU admission may be appropriate.

The Lady Penrhyn leads the fleet - 338 Tons, 103 feet (31.4 meters) long and 27 feet (8.23 meters) beam.

This vessel was one of a fleet of eleven ships that brought the first European settlers to Australia in 1788. The fleet consisted of two Naval "ships of the line", three supply transports, and six convict transports. The Lady Penrhyn was a female convict transport. It crammed in an incredible 82 crew and passengers, and 101 female convicts. Conditions on board the 7 month voyage would have been unbearable. At the time of the undertaking of the "First Fleet", the voyage was considered a major achievement. Around 1,500 people were transported half way across the globe. Never before had so many people been transported in one fleet across the high seas over such a vast distance. Around fifty would die on the voyage, a fact considered to be a "wondrous result" at the time…and probably was! During the voyage there were seven births.

References:

1. eTG - March 2017.

2. RWH Clinical Practice Guidelines July 2009

3. RWH Drugs in Pregnancy and Breastfeeding Guidelines, Accessed May 2017.

4. Metoclopramide and neurological adverse events; Medicines Safety Update, Therapeutic Goods Administration (TGA) in Australian Prescriber, vol 38 no. 1 February 2015

Further reading:

McEvedy C. Atlas of World Population History, Penguin 1978

Kenealley T. The Great Shame, Random House, 1998.

The Great Hunger, Cecil Woodham-Smith, 1962

Dr J Hayes

Acknowledgments:
Pani Lambros
Reviewed 24 May 2017