

# Improving management of patients with hyperemesis

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## Abstract

Hyperemesis gravidarum (HG), defined as severe nausea and vomiting resulting in dehydration, is a common reason for emergency admission in gynaecology (1). The management of HG is supportive, including the correction of dehydration and electrolyte disturbances and use of antiemetics.

An audit in our unit identified that women with HG were not receiving appropriate fluid resuscitation and in particular inadequate potassium replacement. A proforma was developed by a multidisciplinary team to prompt appropriate investigations, medications, and fluid resuscitation. The proforma was introduced in paper format and electronically, accompanied by an education programme for junior doctors.

This intervention has improved prescribing practice and fluid resuscitation for these patients. Length of admission has reduced. Efforts have been made to ensure this change is sustainable in the long term, through involvement of the junior doctors using the proforma at all stages of the project.

## Problem

Hyperemesis gravidarum (HG) is a common reason for emergency admission under the gynaecology team. Anecdotally it was felt that women admitted in our unit were not receiving the best care for several reasons. Patients with HG are usually admitted by junior doctors, such as FY2 and GP trainees, who frequently change posts due to their rotations. This means women may be seen by doctors not familiar with prescribing the appropriate fluids and medications required to alleviate symptoms and prevent complications. Human factors were felt to play a part, with boredom or disinterest as HG was not seen as an 'exciting' condition. There was also reliance on vigilance and memory in prescribing for this condition. In common with many other units, there is no dedicated gynaecology ward so women are admitted to general surgical or medical wards where nursing staff may not be accustomed to caring for patients with HG.

## Background

Nausea and vomiting in the first trimester of pregnancy are common. About 1% of women will have hyperemesis gravidarum, defined as severe nausea and vomiting, resulting in dehydration (1). The causes of HG are multifactorial. Other differential diagnoses such as urinary tract infection need to be excluded. The management of HG is supportive, including the correction of dehydration and electrolyte disturbances and use of antiemetics. Normal saline with potassium replacement is recommended by many authorities (2,3). Dextrose should not be used in order to avoid precipitating Wernicke's encephalopathy. Prevention of complications is also important, such as thiamine to prevent Wernicke's encephalopathy and prophylaxis to reduce the risk of thromboembolic events. Usually HG is not associated with any adverse maternal pregnancy outcomes. There is some evidence

that it may be associated with intrauterine growth restriction, but this may be limited to women who have poor gestational weight gain (4, 5). HG needs to be managed effectively to reduce the risk of complications and to improve maternal psychological well being. It is an important condition as admitting a patient to hospital with HG incurs costs to the health service as well as the wider socioeconomic impact on the woman and her family.

## Baseline Measurement

For this project, measures considered included whether appropriate investigations were performed, such as urea and electrolytes. Secondly, the drug charts were reviewed to record the type and volume of fluid prescribed in the first 24 hours and whether any potassium was added to the intravenous fluids. Prescriptions for antiemetics, thiamine, folic acid and enoxaparin were also audited. The length of admission was recorded, using the A&E admission sheet and the hospital notes.

62 notes of patients admitted with a diagnosis of HG over a 6 month period were retrospectively reviewed. Our results showed that 94% of women had urea and electrolytes measured on admission. A median of 3 litres of fluid was given over the first 24 hours of admission. Only 10% of women had potassium replacement. 85% had enoxaparin prescribed, 91% had thiamine prescribed, and 94% received folic acid. The median duration of admission was 36 hours.

## Design

The results from the initial audit were presented to a multidisciplinary meeting. It was identified that frequent changeover of junior doctors, and their unfamiliarity with the fluid resuscitation regime and appropriate medications for treating HG, were barriers to improving care. Suggestions for improving the prescribing and

fluid resuscitation for these patients were discussed. A proforma for the admitting doctor to use was felt to be the most likely intervention to improve patient care. This was drafted and reviewed in a subsequent multidisciplinary meeting. This proforma had several functions, one was a clerking sheet for the patient, and secondly there was a space to document blood results to prompt action. The fluid resuscitation regime in the guideline was listed. Several choices of antiemetics and the doses required were also listed to improve prescribing. There was a checklist to prompt the correct prescription of folic acid, thiamine and venous thromboembolism prophylaxis. The proforma was ratified by the information governance committee. Copies of the proforma were placed in A&E where patients were seen by the gynaecology on call team, and an electronic version was put on the trust intranet and emailed to all juniors. A teaching session on management of HG was held for all junior doctors, and this was incorporated into the induction programme for new doctors in order to make sure the improvements implemented were sustained through staff changeovers. The costs of implementing the proforma were minimal as it was designed as a single A4 sheet in black and white that could be printed off as required.

## Strategy

In the first PDSA cycle, a proforma was developed and trialled by junior doctors in admitting 2 patients with HG, see figure 1. Feedback from these users included suggestions to provide space on the proforma for clerking the patient so that work was not duplicated. Users also recommended a list of antiemetics should be added, as a prompt for prescribing for juniors. We addressed this feedback by modifying the proforma. A section for clerking the patient was added to the proforma. We also added a checklist for antiemetics that can be prescribed, together with the doses for these medications, to act as an aide-memoire. In the second PDSA cycle the proforma was formally introduced and added to the trust intranet. Junior doctors were also emailed an electronic version. Paper copies were placed in A&E and on the wards. A teaching session was held for junior doctors about the management of HG and the introduction of the proforma. Almost all patients admitted with HG had a proforma completed.

See supplementary file: ds2227.docx - "PDSA Cycles (1&2)"

## Post-Measurement

17 patients were reviewed post proforma implementation. A median of 4L fluid over first 24 hours were given (Mann Whitney U test  $p=0.006$ ). Only 9.7% of patients had potassium replacement in the first audit. 100% received potassium in the re-audit, see figure 2. Prescribing of thiamine, folic acid and enoxaparin also improved to 100%, see figure 3. The median duration of admission was reduced from 37 hours in to 32 hours (non significant).

See supplementary file: ds2226.ppt - "figure 2 and 3"

## Lessons and Limitations

One of the limitations of the proforma was that although it improved prescribing by junior doctors, sometimes fluids and medications were not received in a timely fashion due to other issues. These included delays in transfer to the ward from A&E and a lack of infusion pumps to give fluids at an appropriate rate. We are working to introduce an outpatient unit for these patients with a dedicated nurse. This has been successfully implemented in other units and we hope will reduce the need to admit patients with HG and improve their care.

One of the main lessons was that getting the junior doctors to 'buy in' to using the proforma was vital to its success. We sought feedback and comments from the users we were targeting - the junior doctors, at an early stage in the project. We then used these insights to make important alterations to the initial drafts. This user involvement in the early stages of the project led to high levels of use of the proforma on the 'shop floor' once the proforma was rolled out.

## Conclusion

The proforma improved fluid resuscitation and prescribing. It is a low cost, simple intervention, readily taken up by doctors, that has improved patient care. It has been altered in response to user feedback and will be re-audited. Key to the success of this initiative has been education and ownership of the project by juniors. We have overcome the issues of 'yet another form to fill' by demonstrating that the proforma helps to do the job more easily and improves patient care.

## References

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## Declaration of interests

Nothing to declare