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Reorganising and improving quality of care for hyperemesis gravidarum in a Danish hospital: a quality improvement project

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ABSTRACT

Background Hyperemesis gravidarum (HG) is a pregnancy complication comprising severe nausea and vomiting in pregnancy. It is associated with adverse outcomes for both mother and child. Treatment consists primarily of antiemetics and intravenous fluids; however, support from healthcare professionals is also important.

Local problem At the department of obstetrics at Nordsjællands Hospital, an increasing workload caused challenges regarding patient care and organisation for patients with HG, and exploring possibilities of reorganising HG care to release midwife resources was warranted.

Methods Through input from staff and patients, possible improvements were identified. Plan–do–study–act cycles were conducted with staff and patients, resulting in adjustments in care and organisation and thus use of resources. The specific, measurable, attainable, realistic and timely aims included patient satisfaction and number of follow-ups conducted via phone.

Interventions HG care was relocated to the department of gynaecology, where it was managed primarily by nurses. Staff and patients were actively involved in the process.

Results HG care was successfully relocated without compromising patient satisfaction. Additionally, an option of patient-administered home treatment for selected patients was established.

Conclusion This quality improvement project describes the relocation and set-up of hospital care provided to patients with HG, resulting in high patient satisfaction. This project might serve as an inspiration to other departments of obstetrics and gynaecology.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Patients suffering from hyperemesis gravidarum (HG) often describe lack of support from healthcare professionals and suboptimal access to treatment.

WHAT THIS STUDY ADDS

⇒ High patient satisfaction in this patient population is attainable through patient and staff involvement in care.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This project might serve as an inspiration to other hospital departments looking to change or improve the organisation of care for HG.

BACKGROUND

Nausea and vomiting are common symptoms in pregnancy and do not usually require treatment. However, 0.3%–3.6% of pregnant women experience severe symptoms, needing hospital treatment.[1] This condition labelled hyperemesis gravidarum (HG) lies at the severe end of the clinical spectrum of nausea and vomiting in pregnancy (NVP) and causes weight loss, dehydration and nutritional deficiencies. However, only in recent years, consensus has been reached on a definition of HG, which includes symptom debut before gestational week 16, severe nausea and vomiting, inability to eat and/or drink normally and strong limits to daily activities. Signs of dehydration are deemed contributory but not mandatory for the definition of HG.[2] The condition is associated with adverse outcomes for mother and offspring both in and after pregnancy. Maternal complications in pregnancy include nutritional deficiencies, dehydration, electrolyte imbalances, hematemesis, venous thromboembolisms, Wernicke's encephalopathy and in rare cases even death.[3–8] Additionally, the condition is associated with anxiety, depression and suicidal ideation, and some symptoms might persist beyond pregnancy.[3 9 10]

Fetal adverse outcomes include preterm birth, low birth weight and small for gestational age, and in utero exposure to HG is associated with neurodevelopmental and mental health disorders.[11–13]

HG should be treated with a holistic approach,[14] and support from healthcare professionals is crucial. However, patients frequently report lack of support and suboptimal management by healthcare professionals.[15] Lack of support is associated with

suicidal ideation and request for termination of pregnancy due to the severity of symptoms.[9 16 17]

Management of physical symptoms consists primarily of a range of antiemetics and, in cases with insufficient fluid intake, intravenous rehydration. In rare cases, enteral and even parenteral nutrition is necessary.

Most departments of obstetrics and gynaecology in Danish hospitals offer outpatient treatments with intravenous rehydration administered by either nurses or midwives. Gynaecologists or obstetricians are often involved in prescribing antiemetics; however, antiemetic treatment can also be managed by general practitioners (GPs).

At the local Danish hospital, Nordsjællands Hospital, treatment for HG was administered by midwives in the obstetric department. Care was consistently provided according to local and national guidelines, and patients often expressed satisfaction with treatment. However, patient satisfaction had never been systematically investigated.

In this quality improvement project, we initially aimed to investigate and possibly improve patient satisfaction among women treated for HG at Nordsjællands Hospital. Through dialogue with patients, midwives, nurses, obstetrician–gynaecologists and GPs, we aimed to explore possibilities for improving treatment. Concurrently, we wanted to implement new treatment recommendations according to the 2021 National Guideline on HG.[18] However, during the project period, COVID-19 caused increasing work load in the obstetric department, and this was simultaneously challenged by vacancies in midwife positions limiting staff resources. These circumstances warranted exploration of possible ways to release midwife resources. Reorganising the management of HG care was quickly identified as an option, and thus, the project aim was redefined to reorganising the treatment offered for HG in a manner to release midwife resources while optimising organisation and patient satisfaction.

Context: scope and organisation prior to project initiation

At the patients' first hospital contact, initial assessment of the degree of NVP or HG was performed by a physician in the gynaecological outpatient clinic. The assessment included exclusion of other causes of nausea and vomiting (including blood tests), vital signs, weight, quantification of the degree of NVP/HG symptoms using the Pregnancy Unique Quantification of Emesis-24 (PUQE-24) score,[19] confirmation of intrauterine pregnancy verified by ultrasound and assessment of dehydration and possible need for intravenous fluids. However, no specific parameters to assess hydration status were described in the local guideline, and decision to administrate intravenous fluids was not standardised. Antiemetics were prescribed according to symptom severity and degree of weight loss, and in cases where intravenous fluids were ordered, patients were transferred to the obstetric department, where fluids were administered by midwives.

All patients were provided with a chart for self-monitoring of symptoms including weight two times a week, daily fluid and food intake, and amount of antiemetics taken to quantify severity of symptoms.

Follow-ups were scheduled and conducted by midwives in the obstetric department, and an obstetrician was involved if the patients' symptoms or weight loss did not improve or when new prescriptions for antiemetics were needed. Dieticians were consulted in cases with severe weight loss and/or electrolyte imbalances.

Some patients needed intravenous rehydration several times a week, and on average, the department administered 10 treatments with intravenous rehydration per week. However, with antiemetic treatment, some patients experienced symptom relief and some even restoration of normal daily functioning, yet follow-ups were scheduled for as long as the patients needed prescription antiemetics with focus on possible tapering off medication after gestational week 16. For patients who did not need intravenous fluids, follow-ups were mostly conducted over the phone every 2–3 weeks, where symptom severity was assessed with PUQE-24 score, antiemetic treatment, food and fluid intake; urine and stool outputs were quantified, and patients were asked about whether the condition affected their mood. Number of phone contacts averaged a total of 8.5 calls per week for all patients with HG.

METHODS

This quality improvement project was conducted via plan–do–study–act (PDSA) cycles[20] and followed the Revised Standards for Quality Improvement Reporting Excellence guideline.[21]

The project includes several steps:

- Development of a Patient Satisfaction Questionnaire.
- Identification of possible improvements.
- Establishing a team.
- Preparing reorganisation.
- Reorganisation, implementation and adjusting.

Further initiatives include

- Home treatment.
- Involvement of GPs.

Development of a Patient Satisfaction Questionnaire

A Patient Satisfaction Questionnaire was developed through PDSA cycles with patients with HG who were approached when receiving treatment in the department. The first draft of the questionnaire included questions selected from the National Investigation of Patient Experiences (Landsdækkende Undersøgelse af Patientoplevelser)[22] if they were considered relevant specifically to patients suffering from HG. Questions were modified to cover patient satisfaction related to hospital treatment for HG and included questions about the initial assessment at the first hospital appointment and the follow-ups administered by midwives. Questions regarding the patients' experiences with their GP prior to hospital referral and

if antiemetics had been prescribed by their GP were also included.

To ensure that the included questions were relevant to cover patient satisfaction in women suffering from HG, feedback on the questionnaire was obtained from patients followed up at the hospital due to HG. This resulted in small adjustment and one additional question regarding whether patients had experienced conflicting advice from healthcare professionals.

When further feedback cycles with patients no longer resulted in additional input, the questionnaire was locked.

Prior to implementing changes, baseline patient satisfaction was measured via an anonymous electronic Patient Satisfaction Questionnaire in SurveyXact. Emails containing a link to the questionnaire were distributed to all 15 patients with HG at the time followed up at the department.

Identification of areas of improvement

Input to areas of improvements were collected from patients with HG via the Patient Satisfaction Questionnaires, which included a section where the responder was encouraged to provide feedback in free text. Furthermore, patients were contacted in person at appointments and encouraged to provide feedback on the set-up.

Input from the staff was collected via e-mails sent to all midwives, gynaecological nurses and doctors in the department of obstetrics and gynaecology, informing them about the project and encouraging them to contact the project lead if they had input. Moreover, the midwifery team involved in HG care were contacted in person and encouraged to provide input to improvements. Staff with special expertise in this area and staff with administrative responsibilities also provided input to changes that could improve management of resources.

The suggested initiatives and changes are shown in figure 1.

Several doctors, nurses and midwives expressed that many patients had received suboptimal treatment for HG prior to being referred to the hospital and that many had not been recommended any antiemetics by their GP despite severe symptoms. This was confirmed in the replies from the Patient Satisfaction Questionnaire. Thus, increased focus on initial treatment for NVP and HG by the GPs in the primary sector was identified as a potential factor to improve overall care experienced by patients with HG.

During the early stages of the project, the workload in the obstetric department became increasingly demanding due to COVID-19, which, combined with an increase in vacant positions among midwives, made the situation unsustainable. Thus, it was necessary to evaluate the organisation of midwife resources, and it was decided to relocate the HG care to the department of gynaecology, where intravenous fluids would be administered by nurses, and gynaecologists would be responsible for prescribing antiemetic medication.

Team

The main person responsible for this quality improvement project was an obstetrician–gynaecologist trainee (AO) whose expertise in HG was based on both clinical experience and scientific research in HG and who had coauthored the 2021 National Guideline on HG from the Danish Society of Obstetrics and Gynaecology.[18]

The senior obstetrician responsible for HG care at the hospital prior to the initiation of the project was the main supervisor. A third key person involved was a gynaecologist with expertise in HG who was intent on taking over the organisational responsibility of HG care in the department of gynaecology after the end of the project.

Likewise, the head nurse at the department of gynaecology was a key person, and three nurses volunteered to be part of the HG team responsible for providing and overseeing HG care.

Through dialogue and meetings with the team, the set-up for HG care in the department of gynaecology was decided.

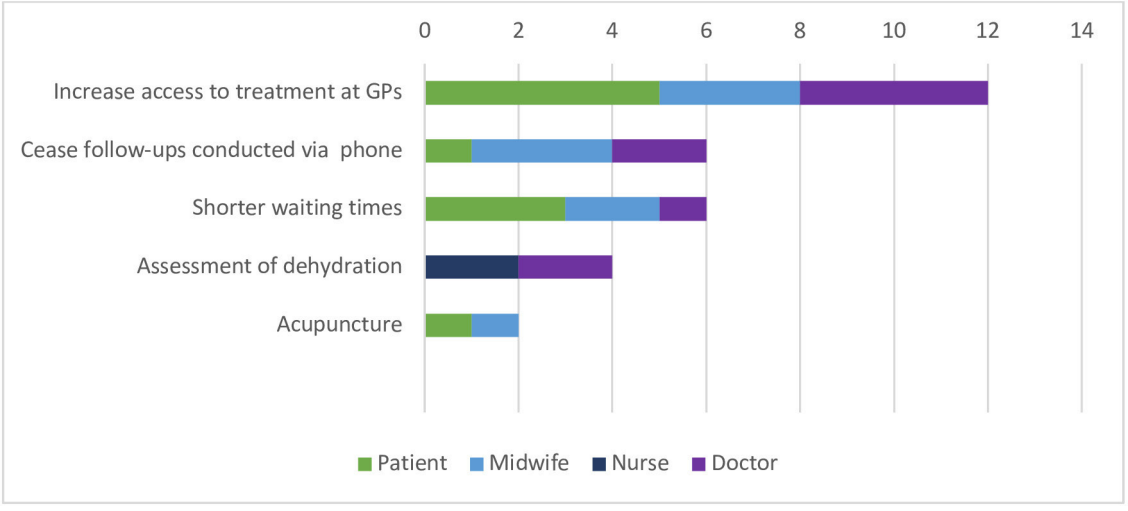

Figure 1 Suggested quality improvements. GP, general practitioner.

Preparing the relocation

It was decided to offer women with HG an open contact with an invitation to call the department when necessary. This set-up was known to the nurses as it was also offered to patients in palliative care. Scheduled appointments were limited to patients with obvious need for intravenous rehydration. A written patient information including when and how to contact the department was developed through PDSA cycles with patients and staff (online supplemental file 6). This would be handed out at the first appointment as would the chart for self-monitoring (online supplemental file 5).

The three nurses in the HG team were appointed HG ambassadors and educated thoroughly on HG and its clinical consequences and the different treatment options, and were prepared for the questions most commonly asked by patients. It was the aim that most women with HG would be seen by a nurse from the team; however, all nurses and doctors in the department of gynaecology had to gain experience in treating this patient category, and AO's approach was leadership through influence with involvement and empowerment of staff and establishment of good relationships.[23] All staff were instructed to call AO if in doubt about anything related to HG.

A binder located in the main office in the department was created containing all the material for HG care, including the patient information, self-monitoring charts, PUQE-score charts and an updated list of recommended antiemetics including dosage, information on side effects and safety profile in pregnancy, to better prepare the staff for the questions patients might have about the recommended medications. The above-mentioned can be found in the online supplementary files 1, 5 and 6.

Likewise, the web-based local guidelines on HG were updated to reflect the new national recommendations, and assessment of dehydration was specified. To ensure usefulness, new doctors in the department were involved in several PDSA cycles, providing feedback on the guidelines.

A prewritten electronic entry to the medical journal including PUQE-score, weight and weight loss, food and fluid intake, etc, was developed through PDSA cycles with nurses to create a structured assessment of patients when they came in for intravenous rehydration.

Measures

The primary measure of this project was overall patient satisfaction measured through the Patient Satisfaction Questionnaire developed specifically for women with HG. Thus, the specific, measurable, attainable, realistic and timely (SMART) aim[24] was patient satisfaction equal to or higher than baseline 6 weeks after relocating.

Second, we wanted to suspend follow-ups conducted via phone with patients who did not require hospital treatment. Thus, the second SMART aim was to eliminate the scheduled phone calls to patients without need for hospital treatment within 3 weeks after relocating.

Even though we aimed to increase knowledge and expertise in treating HG among the GPs in the area, the project did not include a SMART aim on treatment in the primary sector. GPs see HG relatively rarely, and we did not expect to see a measurable improvement within the project period. However, we did aim to start initiatives to improve HG care in the primary sector in the longer term.

RESULTS

Relocating, implementing and study of interventions

On 15 December 2021, the relocation was implemented, and patients scheduled for intravenous hydration started coming to the department of gynaecology where assessment and treatment were administered by the team of nurses.

On the first day, three patients were scheduled to come in for outpatient check-ups and/or intravenous fluids, and AO received seven calls from nurses with questions related to those patients. Within the first week, the number of calls to AO decreased to an average of one call per day, and after a month, AO received two to three calls per week.

During the implementation period, AO was present daily in the department where interventions were studied, and feedback on the management of HG and input to improvements were continuously collected from patients and staff, leading to small adjustments. As an example, to ensure shorter waiting times, optimal times of day for appointments were determined considering the nurses' other daily tasks. Additionally, the frequency of how often patients needing regular treatments with intravenous fluids should be reassessed by a doctor was adjusted to ensure that antiemetic treatment was continuously evaluated and optimised.

Initially, these assessments and treatment adjustments were performed by AO, but gradually, this task was taken over by the gynaecologists in the department, who also contacted AO in case of insecurities. However, insecurities were less and less frequent, thus ensuring sustainability of the care provided after the project period, when AO would not be available.

After input from staff, a patient information leaflet on antiemetic medications was developed through PDSA cycles with patients and staff, and these were routinely handed out to patients at first hospital contact.

Even though one patient and one midwife had suggested offering acupuncture, this was not implemented, as evidence on effect on HG is insufficient,[25] and spending resources on this would be inappropriate.

Home treatment: a new initiative

A couple of weeks after relocating, nurses suggested that one patient with severe HG and a history of HG lasting until delivery might be able to administer intravenous fluids herself at home. There had repeatedly been difficulties placing a peripheral catheter in this patient, and

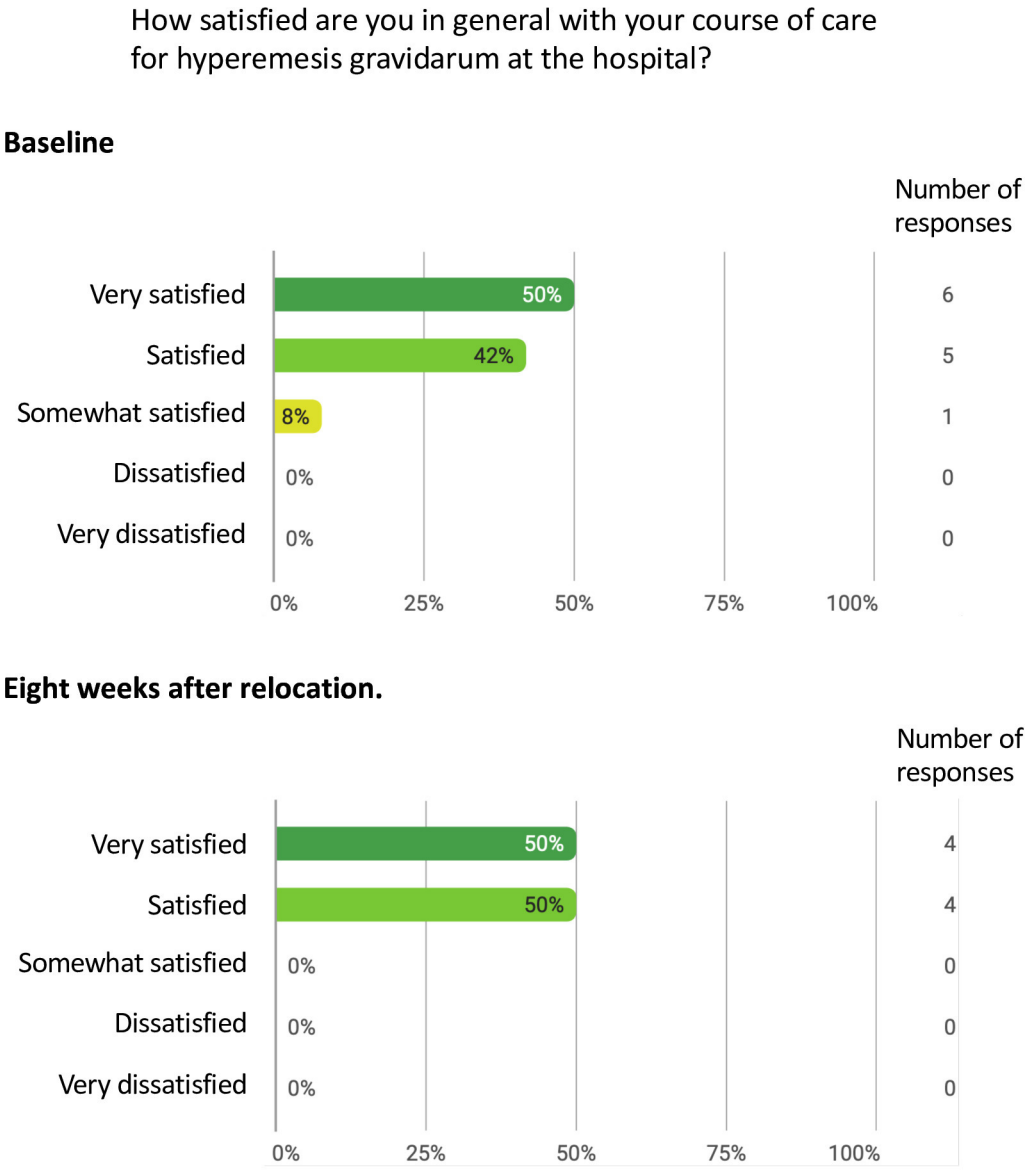

Figure 2 Patient satisfaction.

after consulting an anaesthesiologist, the patient had a central venous catheter installed (Hickman's catheter in the jugular vein). After a few weeks of in-hospital administrations of fluids, the patient was taught how to heparinise the catheter and self-administer both intravenous fluids and ondansetron. After a few days, one additional patient, likewise with a history of HG until delivery, started patient-administered home treatments with intravenous fluids and antiemetics through a similar central venous catheter.

A patient manual for patients with home-administered fluids was developed through PDSA cycles with patients and staff (online supplemental file 2).

Both patients reported high satisfaction with the home treatments, and they expressed relief that they no longer had to make the trip to the hospital several times a week. However, after the ending of the project period, both patients experienced complications due to the installed catheters. One had a thrombosis and one had an infection.

It was agreed that central venous catheter should be offered only as a last resort to highly selected patients complying with the following criteria: severe HG expected to last for months where peripheral catheters were no longer possible. Moreover, in case a patient had a central venous catheter installed, the patient should be treated with prophylactic low molecular weight heparin to minimise the risk of thrombosis.

However, home treatment could also be administered in patients with midlines.

Involvement of GPs

A meeting was held with the representative of the GPs in the area shortly after sending out the baseline Patient Satisfaction Questionnaire. The questionnaire revealed that only 5 out of 11 patients had first-line antiemetics prescribed by their GP prior to being referred to the hospital. These results were presented to the GP representative, and it was discussed how to reach all the GPs

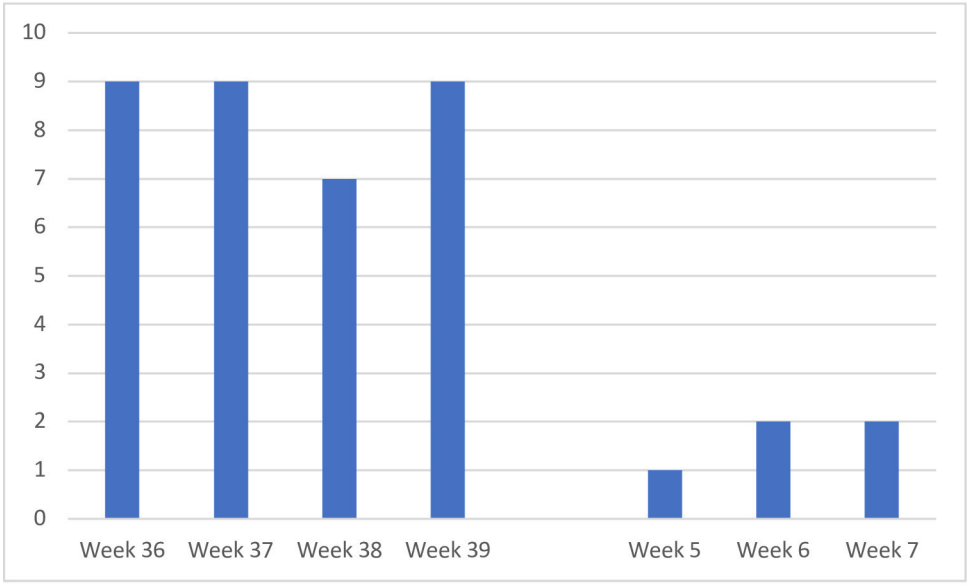

Figure 3 Follow-ups conducted via phone.

in the area to disseminate knowledge and information regarding HG. We agreed to send a synopsis in the regional news bulletin for GPs informing them about the updated web-based national recommendation for GPs on HG.[26] These recommendations were updated by AO concurrently with this project as to reflect the 2021 National Guideline. In the recommendations, GPs were clearly instructed to initiate first-line antiemetics and to refer patients if they did not experience sufficient symptom relief from this.

Furthermore, we agreed to a standard discharge paper that would be sent to the referring GPs after each patient's hospital appointment. The discharge paper contained information about the antiemetics prescribed at the hospital. It was the intention that the discharge paper would provide GPs with enough knowledge about HG and antiemetics that they would renew antiemetic prescriptions initiated at hospital contact. Simultaneously, the discharge paper reminded GPs to consider tapering patients off antiemetics after gestational week 16 if possible. However, it was also specified that for some severely ill patients with HG, antiemetics might be required until delivery.

Leaving more responsibility to GPs allowed us to suspend the continuous telephone follow-ups conducted with patients on prescription antiemetics. We thus spared hospital resources for patients in need of specialised hospital treatment.

Measures

SMART aim 1: patient satisfaction

At baseline, we obtained 12 responses out of 15 Patient Satisfaction Questionnaires distributed to all the patients who where followed up in the obstetric department due to HG at that time.

Eight weeks after implementing the relocation to the department of gynaecology, Patient Satisfaction Questionnaires were distributed among all eight women who had had an appointment at the department due to HG in weeks 6–8 after relocating. All eight women responded.

As shown in figure 2, overall patient satisfaction was comparable at baseline and 8 weeks. Likewise, more specific parts of the questionnaire showed comparable results. The questionnaires are available in the supplementary files 3 and 4.

While the questionnaire did not contain any specific questions about waiting time, a few patients commented on this in the free-text section of the questionnaire. At baseline, one woman wrote that it was unsatisfying that 'she often had to wait to be seen when coming in for treatment'. At the 8 weeks' questionnaire, one woman wrote that she was 'happy that she never had to wait'.

SMART aim 2: elimination of scheduled phone calls

The number of weekly phone calls scheduled with patients without need for hospital treatment was seven to nine prior to relocation and zero 3 weeks after relocating.

However, a new category of phone calls to patients emerged. The phone calls seen in weeks 5–7 were conducted with the two patients receiving home treatment with intravenous fluids (figure 3). These two patients were the most severely affected patients, who would in the old organisation require extensive hospital resources several times a week, had home treatment not been an option.

Overall, this category of phone calls thus represents a shift and an overall release of resources in the department.

DISCUSSION

In this quality improvement project assessing the organisation of outpatient HG treatment, we succeeded in releasing midwife resources by relocating HG care to a

team of gynaecological nurses without compromising patient satisfaction.

Patient satisfaction was high both at baseline and at the end of the project. This is in contrast to several other studies reporting that patients suffering from HG often feel that the severity of their symptoms is being trivialised by healthcare professionals and that the necessary treatment and support are not available.[9 15 16] The high patient satisfaction likely reflects that even prior the this project, this hospital had a well-functioning set-up for HG care and staff had knowledge about the condition. Several doctors in the department have contributed the development of national guidelines on HG, and their interest in the condition has affected how the condition is managed at this hospital. The high patient satisfaction in this project is likely not representative of the wider country.

In this project, we prioritised patient and staff involvement, which ensured that the initiatives were relevant to patients and that staff gained ownership of the process to ensure sustainability after the end of the project.

In addition to reorganising outpatient care in the hospital, we introduced intravenous home treatment for selected patients. This was associated with high patient satisfaction and a release of resources in hospital; however, central venous catheters should be restricted to highly selected patients where all other treatment options have failed due to risk of complications. However, home treatment may be administered in a midline catheter.

After the project period ended, we have seen a few severe cases of HG in the department including substantial weight loss and need for parenteral nutrition. It has become evident that we need more focus on how to manage severe HG cases including optimisation of their course of treatment. We are thus in a process of establishing a multidisciplinary team including doctors, nurses and a dietician to confer these cases on a regular basis.

In addition to the initiatives related to care in the hospital, we aimed to improve access to treatment as the GPs, as this was the most suggested improvement option among staff and patients. Lack of access to treatment at GPs could be a reflection of inconsistency in GPs' knowledge and confidence regarding HG as is reported in other countries.[27] This may be due to overestimation of the risk associated with antiemetics in pregnancy.[28]

To improve treatment for HG and NVP in the primary sector, we made standard discharge papers containing information on antiemetics and a synopsis in the regional news bulletin for GPs on the updated recommendations. However, the results of this effort remain to be seen.

Strengths and limitations

Strong patient involvement both before and after the organisational change is a strength of this quality improvement project, ensuring that the initiatives taken were indeed relevant for the patients' experience and satisfaction.

Additionally, establishing teams and ensuring involvement of staff with hands-on experience improve feasibility and ownership of the project and the HG care in the hospital on longer term.

A limitation, however, is the limited amount of data. Due to the short project period, it was possible to conduct only one evaluation of patient satisfaction after the relocation. Additionally, both the baseline and postrelocation evaluations contained a limited number of responses (12 out of 15 distributed and 8 out of 8 distributed, respectively).

Even though weekly averages of 10 treatments with intravenous fluids were administered at the hospital in the project period, the total number of patients treated in a week at a given time is relatively low, as the same patients come in several times per week. Thus, the eight responses represent all patients with hospital contact due to HG over a course of 3 weeks.

Sustainability

The team of gynaecological nurses faced this new patient category with great dedication and contributed substantially to the success of the project. Their suggestions led to the initiative of home treatment with intravenous fluids for selected patients, and the nurses continue to search for new possibilities to improve the treatment offered and optimally manage hospital resources.

The gynaecologist with expertise in HG who is permanently employed at the department was involved in the project from the beginning and took over the role as the doctor specifically responsible for HG care after the project ended. This ensured the continuous focus on this patient category and the sustainability of the set-up. A team of doctors to confer severe cases is being established to provide input from several angles in the challenging cases.

CONCLUSION

This quality improvement project describes the set-up of HG care in a Danish hospital and the process of successfully relocating care from one department to another. Both staff and patients were involved in the projects, which resulted in a different approach and high patient satisfaction.

This project provides inspiration which might be used in other departments of obstetrics and gynaecology when reviewing the HG care offered there, or when implementing a new strategy for organised HG care in departments where regularly scheduled care currently does not exist.

Contributors The project was set up by AO, TBF, HBW and ECLL, with AO being the main author responsible. AO conducted the first version of the manuscript, and TBF, HBW and ECLL provided feedback and agreed to the final version. AO is the guarantor.

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Competing interests None declared.

Patient and public involvement Patients and the public were involved in the design, conduct, reporting or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants. However, as ethical approval is not required for quality improvement projects in Denmark, this study was exempted from approval by ethics committees. Participants filled out anonymous online questionnaires. This does not require informed consent.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

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