ORIGINAL ARTICLE

Determinants of the need for hospital care among women with nausea and vomiting of pregnancy

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Abstract

Objectives: To characterize a cohort of pregnant women who required hospital care owing to nausea and vomiting of pregnancy (NVP) and to identify variables that could serve as predictors of the need for hospital care.
Design: A retrospective, observational study.
Methods: Between 1996 and 1997, women who suffered from NVP were invited to call the NVP Healthline at The Motherisk Program in Toronto. After obtaining verbal consent, callers were interviewed by trained counsellors through a structured questionnaire about their NVP experience in previous pregnancies. Univariate and multivariate analyses were used to identify factors that could predict the need for hospital care.
Results: In total, 3201 women were recruited;1348 (43.8%) needed hospital care (treatment in the emergency room, day unit or hospital ward). The following characteristics were significantly associated with the need for hospital care: severity of vomiting (more than 5 times a day), use of more than one antiemetic medication, being primigravid, feeling depressed, having had an obstetrician as the primary health care provider and feeling that NVP had affected the partner's daily life.
Conclusions: Several factors, including the severity of physical symptoms of NVP and psychosocial factors, are associated with the need for hospital care. In addition to treatment of physical symptoms, it is important to address other factors associated with NVP.

Résumé

Objectifs : Caractériser une cohorte de femmes enceintes ayant eu besoin de soins hospitaliers en raison de nausées et vomissements gravidiques (NVG) et définir les variables qui pourraient servir de prédicteurs du besoin de soins hospitaliers.

Conception : Étude rétrospective par observation.

Méthodes : Entre 1996 et 1997, on a invité les femmes souffrant de NVG à composer le numéro de la «NVP Healthline» du Motherisk Program de Toronto. Après avoir obtenu le consentement verbal des intéressées, des conseillers ayant reçu la formation nécessaire les ont interviewées au moyen d'un questionnaire structuré portant sur leur expérience de NVG au cours de grossesses antérieures. On a procédé à des analyses unidimensionnelles et multidimensionnelles pour définir les facteurs susceptibles de prédire le besoin de soins hospitaliers.

Résultats : On a recruté au total 3201 femmes;1348 (43,8 %) ont eu besoin de soins à l'hôpital (traitement à l'urgence, court séjour ou hospitalisation). On a établi un lien significatif entre les caractéristiques suivantes et le besoin de soins à l'hôpital : gravité des vomissements (plus de cinq fois par jour), utilisation de plus d'un antiémétique, primiparité, sentiment de dépression, obstétricien comme prestateur de soins primaires et sentiment que les NVG avaient un effet sur la vie quotidienne du partenaire.

Conclusions : On établit un lien entre plusieurs facteurs, y compris la gravité des symptômes physiques de NVG et des facteurs psychosociaux, et le besoin de soins à l'hôpital. Outre le traitement des symptômes physiques, il importe de se pencher sur d'autres facteurs associés aux NVG.

Introduction

Between 50% and 80% of all pregnant women experience some form of nausea or vomiting, or both, in pregnancy (NVP).[1,2] Despite the availability of effective and safe medications for NVP, many women with mild and moderate forms of this condition refrain from using drugs.[3] Recently we have become increasingly aware that NVP affects not only women's physical health, but also their mental health and their occupational, social and domestic functioning.[4]

The negative health consequences and impaired quality of life of pregnant women with NVP result in increased visits to physicians, use of health care resources and hospitalization. Neutel and Johansen[5] reported in 1995 on an increased number of hospitalizations due to NVP, after Bendectin (doxylamine and vitamin B6 combination) was withdrawn from North American markets in 1983. Hospitalization for NVP introduces a heavy economic burden and marks failure to manage this condition at home. Although it is important to better understand the determinants of the need for hospital care, no research has directly addressed this issue. In this paper we studied a cohort of such women to identify variables that could serve as predictors of the need for hospital care.

Patients and methods

During 1996 and the first part of 1997, advertisements in various media were placed in Canada and the United States inviting women who previously had had or were currently suffering NVP to call a toll free NVP Healthline at The Motherisk Program, a teratogen information centre based in Toronto, and share their experience. The Motherisk Program provides evidence-based counselling services to pregnant women and their health care providers regarding fetal risks that may be associated with exposure to drugs, chemicals, radiation or infections during pregnancy and lactation. This report focuses on callers who reported experience of NVP in their previous pregnancies.

The project was approved by the Research Ethics Board of the Hospital for Sick Children, Toronto, and verbal consent was obtained from callers to participate in a 20-minute interview. Interviews were conducted by trained bilingual counsellors and included details about pregnancy in general and NVP specifically. A structured questionnaire was developed and used to collect maternal demographics, data on the severity of physical and emotional symptoms of NVP, characteristics of health care services (focusing on the type of a health care provider as well as the need for hospital care) and treatments (use of antiemetic medication or other therapy for NVP).

The impact of NVP on quality of life was assessed by asking women whether or not they felt that the NVP affected their relationship with their partner and whether their NVP affected their partner's daily life, whether NVP led to feelings of not being supported by their partner, and whether they felt depressed.

Data analysis proceeded in 2 steps: univariate followed by multivariate analysis. Two univariate procedures were employed. Demographic characteristics, physical symptoms of NVP and psychosocial factors between hospitalized and non-hospitalized women were compared by the χ^2 test (for categorical variables) or by Student's *t*-test (for nominal variables).

A p value of less than 0.05 was considered statistically significant. Factors that were significantly different between groups were entered into multivariate analysis in which logistic regression was used to identify possible predictors of the need for hospital care.

Results

Over the study period, 3201 women were interviewed regarding their NVP experience in previous pregnancies. The median elapsed time between the women's pregnancies and their report to the NVP Healthline was 4.37 years. Of those interviewed (the total number varied for each characteristic [Table 1]), 1348 (43.8%) women were seen in hospital (treated in the emergency room, day unit or hospital ward). Almost half of the pregnancies were associated with primigravidas (49%). The pregnancies were mainly single (97.8%), resulting in live births of expected mean birth weight at term. The primary caregivers were predominantly obstetricians (61.2%).

When testing for significance of the physical symptoms of NVP and psychosocial factors, we found that women needing hospitalization felt significantly more depressed ($p < 0.001$), had more episodes of nausea ($p < 0.001$), had vomited more frequently ($p < 0.001$)

and used more antiemetic medications ($p < 0.001$) than women who were not admitted to hospital. Only the type of pregnancy and lack of partner's support were the same for the 2 groups. Maternal characteristics and univariate analysis of their NVP characteristics are shown in more detail in Table 1.

Table 1: Distribution of maternal characteristics among hospitalized and non-hospitalized patients calling the NVP Healthline*

Maternal characteristics	Mother hospitalized, no. (and %†)		*p* value
	Yes	No	
Primigravida			
No	737 (47.2)	826 (52.8)	<0.001
Yes	611 (40.5)	899 (59.5)	
Type of pregnancy			
Single	1248 (43.9)	1596 (56.1)	0.54
Multiple	31 (47.7)	34 (52.3)	
Professional providing obstetric care			
Obstetrician	904 (47.8)	988 (52.2)	
Family doctor	424 (37.2)	717 (62.8)	<0.001
Midwife	16 (26.2)	45 (73.8)	
Nausea‡			
Mild	19 (13.6)	121 (86.4)	
Moderate	55 (24.2)	172 (75.8)	<0.001
Severe	1293 (46.8)	1468 (53.2)	
Vomiting‡			
Mild	59 (10.4)	507 (89.6)	
Moderate	284 (30.7)	641 (69.3)	<0.001
Severe	1017 (62.5)	611 (37.5)	
Antiemetic therapy			
No agent	50 (20.0)	200 (80.0)	
1 agent	176 (24.6)	539 (75.4)	<0.001
>1 agent	1145 (52.5)	1034 (47.5)	
Feelings of depression			
Always	383 (57.8)	280 (42.2)	
Most of the time	379 (49.0)	394 (51.0)	
Sometimes	238 (39.3)	368 (60.7)	<0.001
Rarely	55 (33.7)	108 (66.3)	
Never	222 (30.4)	509 (69.6)	
Lack of partner's support			
No	177 (40.6)	259 (59.4)	0.17
Yes	1175 (44.1)	1490 (55.9)	
Adverse effect on relationship with partner			
No	637 (40.0)	955 (60.0)	<0.001
Yes	693 (47.2)	775 (52.8)	
Adverse effect on partner's life			
No	410 (32.1)	868 (67.9)	<0.001
Yes	923 (51.6)	867 (48.4)	

*Totals for each characteristic vary depending on whether the relevant information was obtained at the interview.
†Percentage within the "independent variable" (i.e., row percentage)
‡Mild = 0 to 1 time/d; Moderate = 2 to 5 times/d; Severe = >5 times/d.
NVP = nausea and vomiting of pregnancy.

Multivariate analysis confirmed that those variables that were statistically significant (except nausea) were predictors of the need for hospital care. Ranked by the strength of the association the factors were as follows: (1) the severity of vomiting, (2) antiemetic medication usage, (3) gravidity, (4) feelings of depression due to NVP, (5) having had an obstetrician as the primary health care provider and (6) NVP having had an adverse effect on partner's daily life (Table 2).

Discussion

Our study has identified several risk factors associated with the need for hospital care among women with NVP. Although the severity of nausea and vomiting was significantly different between hospitalized and non-hospitalized women, multivariate analysis revealed that only vomiting was a significant predictor of the need for hospital care. This makes sense biologically because nausea by itself does not cause dehydration or electrolyte imbalance as does severe vomiting. We have recently documented a highly significant correlation between the mean maximal daily number of vomiting episodes and mean maximal weight loss.[6]

Being a primigravida was a significant factor in predicting the patient's need for hospital care, possibly because of a lack of experience in managing NVP.

The type of professional caregiver also emerged as a predictor of the need for hospital care. Obstetricians are often second- or third-line caregivers who may see

Table 2: Multivariate analysis for predictors of the need for hospital care among women with nausea and vomiting of pregnancy

Predictors	*p* value	Exp (B) (and 95% CI)
Primigravida	0.006	0.78 (0.65–0.93)
Nausea	0.380	1.11 (0.87–1.42)
Vomiting	<0.001	3.21 (2.79–3.69)
Antiemetic therapy	<0.001	2.12 (1.79–2.50)
Professional providing obstetric care	<0.001	1.44 (1.20–1.74)
Adverse effect on partner's life	<0.001	0.55 (0.45–0.67)
Feelings of depression	<0.001	0.85 (0.80–0.91)
Constant	<0.001	

Exp B = 2.718^{B}, where B is the value given by the model for the strength of the prediction of each factor, CI = confidence interval.

patients with more severe NVP. They are also more hospital-based than family physicians. These facts may explain why obstetricians more than family physicians put their patients under hospital care.

Those who reported their NVP experience tended to use more antiemetic medications, which probably reflects the severity of their vomiting. The design of the study did not allow assessment of either the effectiveness of such therapy or whether antiemetic drugs were started early enough to be effective.

Women who needed hospital care were significantly more likely to feel depressed in association with NVP and believed that their NVP had a more adverse effect on the quality of life of their partner. Both variables reflect the serious adverse effects of severe cases of NVP on family functioning. This suggests that psychosocial factors are as important in predicting of the need for hospital care as physical morbidity and should be addressed by the medical community. We have recently documented substantial psychosocial morbidity among women suffering from NVP, even when they are not hospitalized.[7]

This study was retrospective in its design, and there are potential limitations with respect to generalizability of the data. Because women called us several years after their NVP, it may be argued that their recall of details may be limited. However, our experience suggests that hospitalization, severity and frequency of vomiting are well remembered by women for years. Moreover, there is no reason to believe that there is a recall bias, with hospitalized women remembering better than non-hospitalized women. Finally, the very large sample size of over 3000 women may have contributed to reducing the potential for recall insensitivity.

It may be argued that women calling a healthline spontaneously may be skewed toward more psychiatric morbidity, but analysis of associated medical conditions revealed only a 3.4% incidence of depression, well within the expected rate for women of reproductive age.[6] Women with severe NVP commonly report feelings of isolation, depression, lack of support and a perception that their condition is taken lightly by their families and health care providers.[7]

Our analysis revealed that, in addition to the physical severity of NVP, as reflected by the number of vomiting episodes per day, being pregnant for the first time and associated psychosocial morbidity had cumulative effects on the need for hospital care.

In conclusion, these data suggest that in pregnant women who suffer from NVP not only the severity of physical symptoms but also psychosocial factors and pregnancy characteristics increase the need for hospital care. In addition to treatment of vomiting it is important to address the need for psychosocial support of women experiencing severe forms of NVP. Such support may prevent the need for hospitalizaiton of some of these women.

A patient-centred rather than a symptom-centred approach may be more effective in preventing the need for hospital care. Proper timing of proper antiemetic dosing should be adjusted for each patient with supportive psychosocial counselling.

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