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Reviewing the effect of hyperemesis gravidarum on women's lives and mental health

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THE EFFECT OF SEVERE PREGNANCY SICKNESS AND HYPEREMESIS GRAVIDARUM ON WOMEN'S LIVES AND THEIR MENTAL HEALTH: A SYSTEMATIC REVIEW OF QUALITATIVE EVIDENCE

Abstract

In order to understand the association between hyperemesis gravidarum (HG) and psychological morbidity a qualitative literature review of the effects of nausea and vomiting in pregnancy (NVP) and HG was undertaken. An extensive search of multiple databases was undertaken and the results appraised and synthesised.

Four main themes and two subthemes emerged in relation to mental health effects:

1) social isolation; 2) unable to care for self and others or change of role; 3) negative psychological effects (depression, anxiety, guilt and loss of self); 4) sense of dying, suicidal ideation or termination; Subtheme 1) loss of earnings or employment;

Subtheme 2) changes to family plans. A shift towards an holistic biopsychosocial approach to care for HG is required. Healthcare professionals can help women by allowing them to express their feelings and validating them. Where required, referral to the perinatal mental health team or a peer support system may be appropriate.

Keywords

Hyperemesis Gravidarum, Pregnancy Complications, Mental Health, Perinatal Care, Maternal Health, Review

Key points

- The effects of hyperemesis gravidarum on a women's life can negatively affect perinatal mental health

- Despite high quality research spanning over 20 years the effects of the condition are frequently underappreciated
- Healthcare professionals can support women by enabling them to express their feelings and validating their experience
- Referral to perinatal mental health services or peer support networks may be appropriate

Introduction

Hyperemesis Gravidarum (HG) is a pregnancy condition characterised by extreme levels of intractable nausea and vomiting, fatigue, distorted olfaction responses and hypersalivation. Symptoms can lead to dehydration, malnutrition and secondary complications such as Wernicke's encephalopathy, oesophageal tears, hypocalcaemia and thyroid dysfunction (Dean and Gadsby 2013; MacGibbon et al. 2015). HG affects 1-1.5% of the pregnant population, (Einarson et al. 2013) accounting for around 25,000 hospital admissions annually (Gadsby and Barnie-Adshead 2011b). Furthermore, an estimated 30% of pregnant women suffer high levels of morbidity from nausea and vomiting in pregnancy (NVP) without receiving a diagnosis of HG (Gadsby and Barnie-Adshead 2011a). Symptoms of NVP appear on a spectrum ranging from normal to severe and HG is considered to be at the extreme end of that spectrum. As yet there is no internationally agreed definition of HG distinct to NVP (Grooten et al. 2015; Painter et al. 2015). Suggested criteria for diagnosis includes admission to hospital, weight loss of more than five percent and clinical signs of dehydration (Royal College of Obstetricians and Gynaecologists 2016). However, women with severe symptoms who do not fit such criteria, or who meet barriers to accessing treatment, may still have significant psychological distress and mental health effects (Dean and Murphy 2015).

Despite recognition of the severity of symptoms that can occur, the negative effects on women's lives can sometimes be underappreciated by healthcare professionals (HCPs), social workers and the general public (Dean and Marsden 2017; Sykes et al. 2013). A systematic review and meta-analysis in 2016 found a significantly higher rate of depression and anxiety in women with HG compared to controls (Mitchell-Jones et al. 2017). While the association between HG and depression and/or anxiety

has long been recognised, (Munch 2002a) the directional relationship has been controversial and historically mental ill-health has been cited as the cause of HG rather than the result of it (Fairweather 1968). In part this may be due to the, as yet, unknown aetiology of the condition which is likely to be multifactorial and almost certainly contains a genetic element (Fejzo et al. 2008; Mullin et al. 2016). This has resulted in misguided approaches to treatment for HG such as enforced isolation and psychological interrogation which was endorsed as recently as 2004 (Karpel and de Gmeline 2004). A review in 2016 found the enduring stigma surrounding the condition continues to negatively affect the treatment some women receive and can lead to terminations of otherwise wanted pregnancies (Dean 2016). Furthermore, it found the disproven psychiatric origin theory remains an inhibitor to the empathy and care the condition deserves (Dean 2016; Fejzo and MacGibbon 2012).

Medical treatment for HG has seen significant improvements in recent years and guidelines advocate early aggressive treatment of NVP to reduce the risk of hospital admission for HG (Royal College of Obstetricians and Gynaecologists 2016; The American College of Obstetricians and Gynecologists 2015). While treatment guidelines go a long way in ensuring women receive the available treatments in a timely manner, the efficiency of the treatments is often insufficient for HG and many women find little to no benefit from the currently available anti-emetics (Boelig et al. 2016). Ultimately no “cure” is available and treatment serves only to palliate the symptoms until they naturally improve either during or after the pregnancy. It is for this reason that the Mitchell-Jones et al. (2017) review calls for an urgent shift in care and treatment to holistically appreciate and address the psychological symptoms caused by HG. In order to address and offer supportive treatment for the psychological morbidity caused by HG, an understanding of the effects of the

condition on women's lives is required. Such effects cannot be easily identified from a meta-analysis of quantitative depression and anxiety scores. Rather, an exploration of women's experiences is required. The following literature search was undertaken as part of a wider project looking at the effect of HG on women's reproductive lives. The results in relation to mental health effects are reported here, however searches were not limited to mental health. As pregnancy sickness appears on a spectrum of severity, with HG at the extreme end, searches were not limited to HG and pragmatically included milder degrees of NVP as categorised within the studies.

Methods

The search, conducted in November 2016, utilised the Sample, Phenomenon of Interest, Design, Evaluation and Research type (SPIDER) strategy developed by Cooke et al. (2012) to maximise the rigour of the search and ensure all relevant publications were revealed.

Search strategy and exclusion criteria

The following key terms were developed via SPIDER and linked with Boolean operators: (Hyperemesis Gravidarum **OR** Pregnancy Sickness **OR** Nausea Vomiting Pregnancy) **AND** (Impact **OR** Quality of life **OR** Mental Health) **AND** (Experience **OR** Perceptions) **AND** (Interviews **OR** focus groups **OR** lived experience **OR** observation **OR** survey **OR** case study **OR** qualitative **OR** Narrative). The databases AMED, CINAHL, Embase, Joanna Briggs Institute, MedLine, Ovid Medline, PsycArticles, SocINDEX were searched. Figure 1 outlines the findings from the search strategy. No date limitation was initially applied, however, all results were published in the last

25 years and assessed as remaining culturally and medically relevant. No language restrictions were applied during the search.

Further exclusion from screening

After retrieving the full text publications they were screened using the Decision Rules outlined by Henderson and Rheault (2004): Is the research peer reviewed and is the problem researched important to the review question?

Assuming these questions were answered positively then four further screening criteria were applied, and studies not meeting them were excluded from further analysis. The screening criteria asked did the inquiry process; involve observation of social or human problems in a natural setting; interpret the observations; tie the observed phenomenon to understanding, explanation or theory development; meet ethical standards? Following the application of this screening process one quantitative quality of life (QoL) survey (Munch et al. 2011) and one review of quantitative QoL studies (Wood et al. 2013) were also excluded. Additionally, one article, which was a general review of current literature, (Soltani and Taylor 2003) and one publication which was a self-reported narrative was excluded (Dean 2014). Only one non-English publication was identified and resources were not available to translate a Taiwanese study so it was also excluded (Cheng and Chou 2008).

Quality assessment

A total of 11 publications were quality assessed using the Rosalind Franklin- Qualitative Research Appraisal Instrument (RF-QRA) as detailed by Henderson and Rheault (2004). The RF-QRA assesses four aspects of trustworthiness in order to establish a Level of Qualitative Evidence similar to that of the well-established

Sackett's Levels of Evidence used in quantitative research (Henderson and Rheault 2004). The four aspects of trustworthiness are credibility, transferability, dependability and confirmability. The level of quality corresponds to the number of aspects of trustworthiness achieved. Publications assessed to be Level I would have all four aspects of trustworthiness confirmed while Level V publications would demonstrate problems in all four aspects.

Although no specific guidance is provided by Henderson and Rheault (2004) regarding what level of evidence publications should be achieved for inclusion in reviews, for this review only studies achieving Level III or above were included. Thus two publications were excluded: Poursharif et al. (2008), a Level IV study lacking transferability, dependability and confirmability, and Thomas (2004) a Level V study with methodological problems in all four aspects.

Figure 1, in line with the PRISMA guidelines for reporting reviews, summarises the findings from the searching and review process and Table 1 outlines the studies included in the final review along with their Level of Evidence grade.

Figure 1 - Exclusion and inclusion criteria for article selection

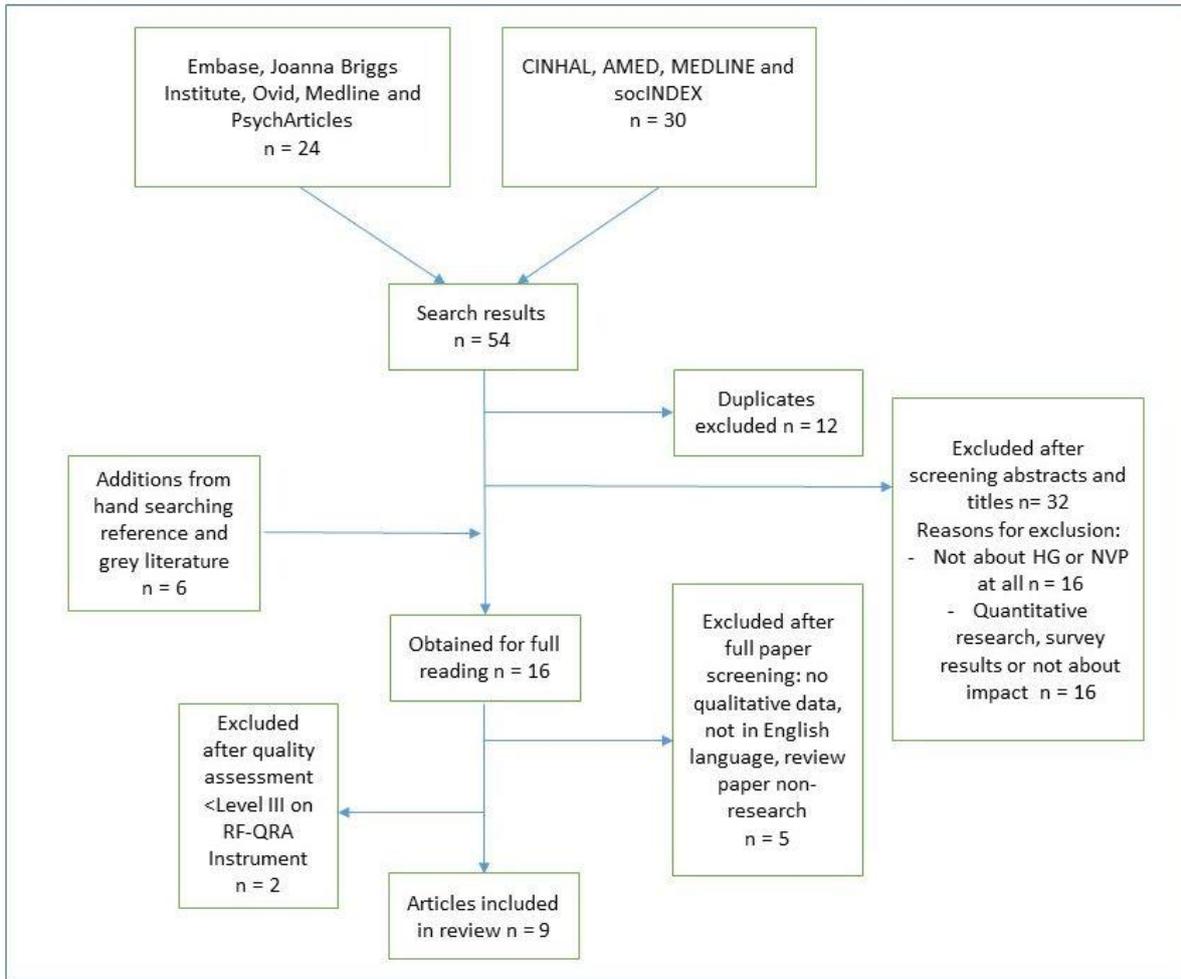


Table 1 - Summary of studies included in review

Study reference	Country of origin	Purpose and methods	Participants	Analysis	Summary of finding	RF-QRA Level of Qualitative Evidence
O'Brien and Naber (1992)	United States of America (USA)	To examine alterations in family, social and occupational functioning due to NVP and factors that helped or worsened symptoms via semi-structured phone interviews	27 women participated. five women had severe symptoms or HG, eight women had moderate symptoms and 14 women had less severe or mild symptoms	Unclear how themes and categories were established. Work was part of a larger quantitative project, serving to triangulate the results and describe the experiences	Changes in family, social and occupational functioning were significant and greater for most participants than is generally believed. Resting was the most important factor in managing symptoms. Olfactory and other sensory stimulation and certain foods and drinks intensified symptoms.	III
O'Brien et al. (1997)	Canada	To assess symptom distress and severity over seven days and evaluate efficiency of symptom relief measures. Seven day symptom and intervention diaries were used to collect data	162 women experiencing NVP and over the age of 16 enrolled. 124 completed diaries were returned for analysis	Content analysis by two researchers plus research assistant. Categories and themes reached by discussion until consensus	Many women, particularly those with more severe symptoms reported that "nothing helped". Women altered normal activities, controlled their environment, implemented eating and drinking strategies and used medication. Sensory and olfactory stimulation exacerbated symptoms.	II
Munch (2002b)	USA	Investigating women's own beliefs about the cause of HG, the seriousness of the illness and the effect on their daily lives. Data collected via semi-structured telephone interviews	96 women who had been hospitalised for HG	The researcher conducted a rigorous thematic analysis using a constant comparative method. Although there was only one researcher she describes employing an audit trail to safeguard against investigator bias	Women consider their HG to have a physiological cause and reject the notion of a psychological aetiology although stress exacerbated symptoms. HG negatively affected their daily lives and consequences included lost wages and jobs, inability to self-care or maintain a household and childcare issues. Women reported that family, friends and employers expected them to maintain their roles as mothers, wives and employees whilst ill.	III
O'Brien et al. (2002)	Canada	To understand how women cope with severe NVP semi-structured interviews in hospital or on the phone were conducted and one focus group was held.	24 women admitted to hospital for HG participated. 16 had one interview, four women had two interviews and four took part in a focus group	Rigorous and careful analysis is described and conducted by multiple researchers. Categories determined by consensus and emerging theory was presented to the focus group also	Women experienced profound loneliness through a need for complete social and physical isolation to cope with symptoms, loss of control over almost every aspect of life and feelings of guilt and helplessness.	II
Meighan and Wood (2005)	USA	To describe the experience of HG and explore how it effects peri-natal maternal role assumption via interviews	Eight women with HG	The study describes a rigorous analysis process by the two researchers using open coding followed by	The core category was Struggling with Sickness then Regaining Control and Making Up for Lost Time. Subcategories include Seeking a Cause, a Remedy, an End or	II

				axial coding and constant comparative analysis	Learning to live with it. HG seriously affected peri-natal maternal role assumption.	
Chou et al. (2006)	Taiwan	To gain an in-depth understanding of how Taiwanese women cope with NVP via face-to-face interviews with open ended questions	Purposive sample of 10 women with mild-moderate NVP. Women with HG were excluded	Analysis was in the original language and translated after for publication. Authors state they used "Colaizzi's analysis steps."; an approach to phenomenological analysis	Four themes emerged: understanding the NVP, finding coping strategies, psychosocial adaptation and needing support. Given the women in this study had mild-moderate symptoms the severity of adverse effects is striking.	II
Locock et al. (2008)	UK	To explore women's experiences of NVP. In-depth narrative interviews were conducted face-to-face	As part of two projects a total of 66 women, seven couples and three male partners were interviewed. Levels of NVP varied from mild to HG. Participants were recruited to obtain maximum variation	As part of the DIPEX research programme data were coded systematically using software and analysed thematically independently by two researchers.	NVP appeared on a continuum from no sickness to hyperemesis. Sickness was something to be: expected, survived, resisted, resented and acknowledged. Women felt little control over symptoms and women with more severe sickness doubted they could endure another pregnancy with a child to look after. When NVP is worse than expected it is very disruptive to women's lives.	I
Power et al. (2010)	United Kingdom (UK)	To describe the experience of HG from the woman's perspective and explore with HCPs barriers/facilitators to caring for women with HG via in-depth, semi-structured interviews with women and focus groups with staff	18 women with HG were interviewed and seven staff focus groups with 60 HCPs	Line-by-line coding to identify categories via the constant comparative method. Key categories were compared with findings from ongoing Quantitative study for evidence to support or refute themes. Unclear how many researchers were involved in analysis	The main themes were the effect and burden of symptoms, managing the burden and women's feelings of being unworthy for medical attention. They found that HG affected every aspect of a women's life and made day-to-day functioning very difficult or impossible. Families and paid employment were also negatively affected.	II
Isbir and Mete (2013)	Turkey	To explore how Turkish women experience NVP based on "Roy Adaption Model" in-depth face-to-face interviews were conducted	35 pregnant women with NVP for at least three days. No distinction is made with HG	Careful translation of data occurred and content analysis conducted independently by two researchers and presented to three further experts for monitoring	Wide ranging effects on women's physiological state, self-concept, role functionality and social interactions described.	I

Critical appraisal of the literature

Overall the quality of the nine publications included was high with two studies achieving Level I, (Isbir and Mete 2013; Locock et al. 2008), five studies achieving Level II (Chou et al. 2006; Meighan and Wood 2005; O'Brien et al. 2002; O'Brien et al. 1997; Power et al. 2010) and two studies appraised as Level III (Munch 2002b; O'Brien and Naber 1992). All publications, except the two Level I studies (Isbir and Mete 2013; Locock et al. 2008), lacked demographic diversity and across all the Level II studies this was highlighted in the report when trustworthiness was discussed. The only study to adequately address transferability was Locock et al. (2008) who specifically recruited for maximum variation, ensuring that the sample was proportionally diverse for both demographics and experience. Cultural differences could have affected the interpretation of some results. Isbir and Mete (2013) recruited from a metropolitan city in Turkey whilst Chou et al. (2006) conducted face-to-face interviews with 10 purposefully sampled Taiwanese women experiencing mild to moderate NVP. The remaining samples were from Western societies. Reflexivity and/or field journaling by the authors was generally lacking; a feature which, given the well-documented stigma and misconceptions surrounding HG, would add strength to research in this field (Dean 2016). There are two exceptions to this, Meighan and Wood (2005) and Munch (2002b) both of whom use journaling as strategies to increase trustworthiness.

Synthesis of the data and development of themes

A summary of the findings and the identified themes were extracted (see Table 1) and coded for analysis. As new descriptive themes emerged the data was analysed iteratively using the constant comparison method. Contrary evidence was sought and a table matrix developed to locate cross-study themes.

Results

A number of negative themes emerged across the publications. None of the studies reported positive aspects of HG although Locock et al. (2008) and O'Brien and Naber (1992) both reported women with “morning sickness” saw nausea as a positive sign and it was particularly welcome in those women who had previously experienced miscarriage or still birth. However, despite nausea being expected, and even welcomed, their participants were surprised by how unpleasant it was. Four main themes, directly related to mental health and wellbeing, emerged from the studies; they addressed the depth and breadth of the effects NVP and HG had on participants. These are: 1) social isolation; 2) unable to care for self and others or change of role; 3) negative psychological effects (depression, anxiety, guilt and loss of self); 4) sense of dying, suicidal ideation or termination. A further two subthemes, indirectly related to mental health and wellbeing, were found: loss of earnings or employment and changes to family plans. The occurrences of each theme per study are identified in Table 2.

Table 2 - Themes present in each study

Study reference	Social Isolation	Unable to care for self and others, change of role	Negative psychological effect, depression, anxiety, guilt and loss of self	Sense of Dying, suicidal ideation or termination discussed	Loss of earnings or employment	Change to family plans
O'Brien and Naber (1992)	✓	✓	✓	✓	✓	✓
O'Brien et al. (1997)	✓					
Munch (2002b)	✓	✓	✓		✓	
O'Brien et al. (2002)	✓	✓	✓	✓	✓	
Meighan and Wood (2005)	✓	✓	✓	✓	✓	✓
Chou et al. (2006)	✓	✓		✓		
Locock et al. (2008)			✓			✓
Power et al. (2010)		✓	✓	✓	✓	
Isbir and Mete (2013)	✓	✓	✓	✓		

Social Isolation

Social isolation is a theme in seven of the studies reviewed (Chou et al. 2006; Isbir and Mete 2013; Meighan and Wood 2005; Munch 2002b; O'Brien et al. 2002; O'Brien and Naber 1992; O'Brien et al. 1997). Three key causes of isolation emerge from the review. In five studies, isolation was described as a self-imposed strategy to manage symptoms which were exacerbated by sensory stimulation and movement, yet loneliness occurred as a result (Chou et al. 2006; Isbir and Mete 2013; O'Brien et al. 2002; O'Brien and Naber 1992; O'Brien et al. 1997). Fear of public vomiting, and the humiliation that would cause, was another reason for isolation reported in four studies (Chou et al. 2006; Meighan and Wood 2005; O'Brien et al. 2002; O'Brien and Naber 1992). Three studies found some women isolated themselves to avoid the negative responses from other people who questioned the reality or severity of their illness (Meighan and Wood 2005; Munch 2002b; O'Brien and Naber 1992). Munch (2002b) highlights an example of this with the following quote from a participant:

As far as other women in the public and other people, they think it's all in your head, and they don't understand why you're so sick. Because they weren't sick, they think you're just weak (pg. 69).

Inability to care for self and others, change of role

Seven studies found some women reported not being able to perform self-care activities due to an exacerbation of symptoms caused by such movements such as showering (Chou et al. 2006), brushing their teeth and hair, getting dressed (Isbir and Mete 2013), eating or preparing food (Meighan and Wood 2005; O'Brien et al. 2002), or even standing up unaided (Power et al. 2010). These adverse effects seem

substantial yet are often mentioned only briefly in comparison to the effect of women's inability to look after their families. Failing to achieve expected chores such as cooking for their husbands or completing housework tasks is mentioned by multiple women in five studies (Isbir and Mete 2013; Meighan and Wood 2005; Munch 2002b; O'Brien et al. 2002; O'Brien and Naber 1992).

Childcare is a pressing issue for a number of women in four studies and is linked closely with the other themes of changes to family plans and feelings of guilt (Isbir and Mete 2013; Locock et al. 2008; O'Brien et al. 2002; O'Brien and Naber 1992). Munch (2002b) further discusses the incompatibility between the expectations of women to continue their daily roles of mother, wife, employee and the reality of them experiencing a severely debilitating illness. She posits that the unrealistic expectations are due, in part, to the belief that HG is not an illness but a normal part of pregnancy; an argument supported by others (Isbir and Mete 2013; O'Brien and Naber 1992; Power et al. 2010).

Negative psychological effects (depression, anxiety, guilt and loss of self)

All, except two (Chou et al. 2006; O'Brien et al. 1997), of the studies discuss the far reaching, and often profound, negative psychological effects severe NVP and HG cause for participants. Furthermore, despite historic suggestions of a psychological aetiology for HG, a number of participants in these studies emphasise that the negative psychological sequela are caused by the NVP or HG rather than the source of symptoms. As Power et al. (2010) states "*The women were in no doubt that their emotional problems were a result of nausea and vomiting and not a cause of it*" (pg. 240). Munch (2002b) specifically looked at causal explanations for HG and the

predominant theme of her findings was stress resulted from HG rather than caused it; women made statements such as *“I wasn’t stressed until I got sick”* (pg. 67).

However, she further explores the ensuing cycle which occurs whereby the physical symptoms and emotional response become intertwined and both become exacerbated.

O'Brien et al. (2002) describe the loss of self and feelings of guilt due to helplessness as the worst effect of HG. One source of guilt described was the inability to fulfil pre-conceptual roles and a sense of responsibility for the severity of the condition. The loss of self was intrinsically intertwined with all other facets of the condition, as one woman describes:

I stay at home and it’s between my bed and my rocking chair and the toilet and that’s basically what my life consists of (pg. 307)

Locock et al. (2008) parallels this loss of self as the sort of “biographical disruption” described by people with chronic illnesses. While they acknowledge that, unlike chronic illness, NVP and HG are transient and time-limited they suggest such adverse effects may be heightened when one’s identity is already going through a process of redefinition and uncertainty due to the pregnancy itself.

Sense of dying, suicidal ideation or termination

Discussion of termination of pregnancy occurred in a four studies (Chou et al. 2006; Isbir and Mete 2013; Meighan and Wood 2005; O'Brien et al. 2002), although it was not the only method of ending the illness that was identified. Meighan and Wood (2005) interviewed eight women who had experienced HG and found most women

considered various options for ending the misery they were experiencing. One woman considered termination, another repeatedly asked doctors to induce labour early to end the sickness and a number of women mentioned the possibility of their own death, either fearing it or wishing for it. Morbid thought and suicidal ideation was not unique to Meighan and Wood (2005). O'Brien et al. (2002), O'Brien and Naber (1992), and Power et al. (2010) all explore cases of women thinking they are dying or wishing to die. O'Brien et al. (2002) illustrate the phase of illness they describe as "Annihilation" with the following quotes:

I want my life back; I am dying; I felt really not alive. It's like I really don't exist anymore, and I am hyperemesis (pg. 306).

It was so bad I was even thinking about getting an abortion because I couldn't endure it anymore... I thought this is not worth killing myself over (pg. 306).

One woman in the Isbir and Mete (2013) study expresses a desire to terminate her pregnancy, despite religious belief condemning abortion, and describes the additional struggles such conflict invokes. Whereas a woman in Chou et al. (2006) describes strong family support as the reason she avoided terminating the pregnancy.

Loss of earnings or employment

Given the inability of women with HG to care for their homes, families and self, it is unsurprising that employment was affected and, in turn, a number of women across three studies reported financial hardship (Munch 2002b; O'Brien et al. 2002; O'Brien and Naber 1992). Munch (2002b) provides the richest discussion around

employment, again expressing surprise at the expectation of employers for women to work despite a debilitating illness:

In fact, my office called because I couldn't come to work for a couple of weeks and told me that if I wanted my job I better get back to the office (pg 68-69).

Changes to family plans

A number of women in three studies state that they do not want more children due to HG. Four of the five HG diagnosed women in O'Brien and Naber (1992) state they would not plan or welcome another pregnancy. Women in both Meighan and Wood (2005) and Locock et al. (2008) support this with a participant in the later explaining their decision thus:

That was another big factor in deciding not to have any more, because I thought I cannot even imagine having to look after a child when you're feeling like this (pg. 149).

Discussion

A limitation across all the studies is the lack of diversity in the samples with a dominance of married women from higher than average socioeconomic status within their populations; the exceptions were Munch (2002b) and Locock et al. (2008) It seems likely that pre-existing psychosocial or financial stressors would amplify the adverse effects of HG as described in this review. Whilst the diversity in the samples is no small concern, the publications themselves offer some demographic diversity with research from the United States (US) (Meighan and Wood 2005; Munch 2002b;

O'Brien and Naber 1992), Canada (O'Brien et al. 2002; O'Brien et al. 1997), Taiwan (Chou et al. 2006), Turkey (Isbir and Mete 2013) and across multiple UK regions (Locock et al. 2008; Power et al. 2010). However, there remain entire parts of the globe which are not represented in the studies included in this review.

The earliest included study dates back to 1992 and good quality research has been consistently published until the most recent reviewed here in 2013. All of the studies provide in-depth descriptions of the immediate and profound ways NVP and HG affects women's lives and the lives of their families during pregnancy. However, there is a lack of discussion regarding long term effects on women's mental health. A number of the excluded publications, and other literature, alludes to severe long term mental health problems as a result of HG, such as Post Traumatic Stress Disorder, but the quality of the evidence is lacking. This is an area which warrants further investigation (Christodoulou-Smith et al. 2011; Mitchell-Jones et al. 2017; Poursharif et al. 2008).

This review was not limited to women with HG and specifically included women with milder levels of NVP. As discussed above, there is not yet an internationally agreed definition of HG as a distinct condition from moderate or severe NVP, nor are there clinical categories of severity of NVP. This means making such distinctions in research is problematic (Grooten et al. 2015). By including women with a range of experience with regards to severity of NVP this review highlights negative effects can occur for women across the spectrum. While effects maybe increased for those experiencing HG, those without a clinical diagnosis of HG may suffer adverse psychosocial effects from symptoms. One participant in the Chou et al. (2006) study, which specifically excluded women diagnosed with HG, considered terminating her wanted pregnancy due to the severity of the NVP symptoms.

Given that infertility has been well established to have a negative long term psychological effect on women, men and within couples (Luk and Loke 2015), it seems reasonable to postulate that other reproductive obstacles, such as a medical condition in pregnancy, could have similar effect. This review suggests that women's reproductive choices and planning is adversely effected by HG and the findings are supported by other authors such as Poursharif et al. (2008) and Dean (2014). However, there is a paucity of high quality qualitative research addressing how their choices and plans are affected by the probability of HG recurring. How HG affects women who already have children and their families is also not sufficiently addressed in this review and there is a clear need for further research into this specific area. In their exploration of women's experiences of terminating for HG Dean and Murphy (2015) found that the stress of childcare, and inability to care for their families, was a major reason for women terminating otherwise wanted pregnancies. The report suggested that the grief following termination was comparable to that expressed by couples who undergo abortion for congenital abnormalities and could persist for many months or years. Further qualitative exploration of such experiences would be highly valuable.

Social isolation, lack of supportive relationships and stressful life events, such as illness, are established risk factors for peri and post-natal depression (Hammond and Crozier 2007; Husain et al. 2012). The literature presented here does not always make a direct link between the individual effects and a negative mental health outcome. However, the accumulation of risk factors - social isolation, financial worries, employment vulnerability and so on - are likely to have a snowball effect as many of the women experienced multiple effects from HG.

Suicide is the leading cause of maternal death in the 12 months post-partum (Knight et al. 2016). Given the number of papers identifying morbid thought and suicidal ideation among their participants is of particular concern and needs rapid further investigation.

Limitations of this review

The majority of studies reviewed are somewhat dated, which may reflect a lack of recent high quality qualitative research into the effect of NVP and HG. Despite this, the studies included remain culturally relevant in their contexts. The lack of diversity and global representation as discussed above is also a limitation and additionally reflective of the paucity of international qualitative research into NVP and HG. As with most qualitative research results from this review may not be generalizable to wider populations and women's experiences of severe illness will vary for individuals.

Clinical Implications

As discussed earlier, there remains a persistent stigmatisation on HG, in part due to psychiatric aetiology theories, which can affect the care and treatment women receive (Dean 2016). Arguably, whether mental ill health is a result of HG or a cause of it should not actually alter the quality of care women receive. Increasing awareness among HCPs, and indeed the public, of the biological origin and psychological response may help to breakdown such stigma (Mitchell-Jones et al. 2017). Reassuring women that it is understandable to feel depressed and anxious when experiencing such extreme symptoms, thereby validating their experience is likely to be reassuring (Kim et al. 2009).

Understanding the myriad of effects NVP and HG has on women and their family's lives, as highlighted in this review, may help HCPs develop an empathetic appreciation of the psychological burden women are put under. The clinical approach may also shift to holistically encompass the extensive biopsychosocial effects. Kim et al. (2009) suggest a number of approaches for helping women with HG such as allowing women to express the physical and emotional distress, frustration and disappointment they are feeling and validate their feelings. They recommend practitioners do not attempt to connect the stress and physical symptoms initially but rather try to strategize how stress can be reduced, such as family members relieving them of daily responsibility burdens.

Assessing a women's support network or helping her to establish one may be of practical benefit. Kim et al. (2009) suggest providing education to a women's psychosocial support network regarding the biological nature of the condition and stress responses to severe illness. Professionals can also refer women to charitable support networks which now exist around the world and is a recommended action in the UK Green-top Guidelines (Royal College of Obstetricians and Gynaecologists 2016) (see Box 1 for details of international HG support groups).

Additional strategies to reduce the burden include: planning treatment so as to reduce familial disruption, such as outpatient or at-home rehydration services; an aggressive approach to anti-emetic therapy to control physical symptoms; information provision about the condition and its treatments and, where appropriate, referral to perinatal mental health services (Royal College of Obstetricians and Gynaecologists 2016).

UK:

Pregnancy Sickness Support is a charity with a peer-support-network, helpline and online support forum. Women can call the helpline on +44 (0)24 7638 2020 or go to their website at: www.pregnancysicknesssupport.org.uk

USA and international:

The Hyperemesis Education and Research (HER) Foundation is a charity which has volunteers predominantly in the USA but collaborates internationally with women across the globe. Women can get in touch via the website www.helper.org

Conclusion

This review highlights the diverse and profound effects NVP and HG can have on a woman's life which can negatively affect their mental health. Social isolation is known to be a major risk factor for post-natal depression; this review demonstrates that for women with severe NVP or HG social isolation can begin in early pregnancy and may persist throughout. Pressures to maintain social roles such as mother, wife and employee, in the face of severe illness, are contributing to stress and anxiety. Associated with NVP and HG are morbid thought, suicidal ideation and termination of otherwise wanted pregnancies. Whether the psychological morbidity ends when the physical symptoms end is yet to be satisfactorily explored and it is likely that mental ill-health persists beyond the end of the pregnancy.

Healthcare professionals need to be aware of the effects this debilitating condition can have on women's lives so that treatment can be planned holistically. They can help by giving voice to, and validating feelings of psychological distress in the women they care for and referring appropriately for support.

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