The emotional burden of miscarriage for women and their partners: trajectories of anxiety and depression over 13 months

GP Cumming, S Klein, D Bolsover, AJ Lee, DA Alexander, M Maclean, JD Jurgens

Department of Obstetrics and Gynaecology, Dr Gray’s Hospital, Elgin, UK
Aberdeen Centre for Trauma Research, Faculty of Health and Social Care, The Robert Gordon University, Aberdeen, UK
Aberdeen Centre for Trauma Research, Royal Cornhill Hospital, NHS Grampian, Aberdeen, UK
Department of General Practice and Primary Care, University of Aberdeen, Aberdeen, UK
Early Pregnancy Assessment Unit, Hairmyres Hospital, East Kilbride, UK
Falkirk and District Royal Infirmary, NHS Forth Valley, Falkirk, UK

Correspondence: Dr GP Cumming, Department of Obstetrics and Gynaecology, Dr Gray’s Hospital, Elgin IV30 1SN, UK.
Email grant.cumming@nhs.net

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Objective To identify the trajectories of anxiety and depression in women and in their partners over 13 months after miscarriage.

Design A prospective study with follow up at 6 and 13 months after miscarriage.

Setting Three Scottish Early Pregnancy Assessment Units.

Sample Of the 1443 eligible individuals approached, 686 (48.3%) consented to participate (432 women; 254 men). Complete data were obtained from 273 women and 133 men at baseline, 6, and 13 months.

Methods On completion of the management of the index miscarriage, eligible and consenting women and men underwent an initial assessment comprising a semi-structured interview and a standardised self-report questionnaire. The latter was readministered at the follow-up assessments.

Main outcome measures The hospital anxiety and depression scale (HADS), a reliable and valid measure of general psychopathology for use in nonpsychiatric samples.

Results Compared with depression, anxiety was overall the greater clinical burden. Over the 13-month period, women reported higher levels of anxiety and depression than men. Over time, a significantly greater level of adjustment was reported by women particularly with regards to the resolution of anxiety symptoms. The effect of time on HADS scores in either gender was similar between subgroups of socio-demographic and clinical factors.

Conclusions These findings verify that early pregnancy loss represents a significant emotional burden for women, and to some extent for men, especially with regards to anxiety. For many, the detrimental effects of miscarriage are enduring and display a complex course of resolution. These findings are discussed in terms of their clinical implications for early identification and management.

Keywords Anxiety, depression, hospital anxiety and depression scale, miscarriage.

Introduction Early pregnancy failure is the most common complication of pregnancy in the UK. While it is generally accepted that clinically identified pregnancies have a miscarriage rate of 15%, an upper estimate of 80% has been suggested to account for those pregnancy losses, which also occur prior to implantation. Epidemiological data indicate that 70 000–90 000 miscarriages occur per year in England and Wales.

The unanticipated and sudden loss of a pregnancy can be a devastating and traumatic experience resulting in high levels of psychological morbidity for some women. Yet, the emotional burden of early pregnancy loss is commonly not recognised by healthcare professionals, as evidenced by reports of dissatisfaction with care following miscarriage.

Research and clinical attention have predominantly focused on identifying the prevalence of depression in women following early pregnancy loss. The focus of attention has
shifted to investigating the extent to which miscarriage is perceived as an anxiety-provoking event (e.g. due to either fears about possible underlying medical or genetic factors that may have contributed to the loss or to doubts about procreative competence). Although women appear to be at increased risk of developing anxiety symptoms immediately following miscarriage\(^\text{10,11}\) and up to 4 months after the event,\(^\text{12}\) the extent to which women experience enduring anxiety as a result of miscarriage is less clear. Interpretation of findings is restricted further by a preponderance of studies based on small sample sizes and the use of inconsistent methodological practices, including variable assessment points, a lack of consensus with regards to the definition of miscarriage, and different assessment measures.\(^\text{5}\)

Within the domain of reproductive health, there is an increasing awareness of the need to consider the impact of early pregnancy loss on men.\(^\text{13,14}\) Limited evidence suggests that they may also experience adverse effects, even though their strategies for dealing with the loss may differ from those of women.\(^\text{15}\) The majority of these studies, however, have used case studies based on qualitative research methods;\(^\text{16–19}\) an approach which severely restricts the potential for comparative studies and the extent to which the findings are generalisable to the larger population.\(^\text{5}\) To our knowledge, only one previous study has evaluated the potential gender differences in the development of anxiety after miscarriage. Beutel \textit{et al}\(^\text{15}\) found that men reported significantly lower anxiety scores than women immediately after the loss.

Few studies have attempted to assess the long-term impact of miscarriage. Thus, there is a paucity of knowledge as to those vulnerability and resilience factors that shape the trajectory of adaptation to early pregnancy loss.\(^\text{20}\) The investigation of mediators that increase or attenuate risk for the development of psychopathology after miscarriage includes socio-demographic factors, previous mental health history, reproductive history (e.g. infertility problems and experience of previous miscarriage), and the current pregnancy (e.g. whether the pregnancy was planned and/or wanted and satisfaction with medical care). The one consistent finding emerging from such research is that those who have suffered significant psychological distress in the past are particularly vulnerable to the development of subsequent psychopathology and problems of psychosocial adjustment.\(^\text{21}\) A major limitation of many of these previous studies, however, is their failure to use multivariate methods of analysis to examine the multifaceted and interactive nature of risk factors and their relative contribution to outcome.

To counter limitations identified in previous studies and to advance the understanding of the emotional burden of miscarriage, the aim of this paper was to present the findings of a large longitudinal study to compare the trajectories of anxiety and depression in women and in men over 13 months after miscarriage. The clinical implications of these findings are discussed in terms of early identification and management of such sequelae.

### Methods

#### Design

This was a prospective study of a large sample of women and their partners who attended consecutively one of three Early Pregnancy Assessment Units (EPAUs) in Scotland with assessments at 1, 6, and 13 months after miscarriage.

#### Assessments

These were conducted by means of a semi-structured interview conducted at baseline (i.e. 1 month after miscarriage) and the administration of the hospital anxiety and depression scale (HADS)\(^\text{22}\) across the three time points.

The semi-structured interview was designed specifically to obtain both qualitative and quantitative data to identify predictive factors associated with ‘caseness’ as measured by the HADS at the two follow-up assessment points. Data were obtained on socio-demographic characteristics, clinical characteristics (pregnancy-related factors, obstetric history, and previous mental health problems), and satisfaction with care. The face validity and acceptability of the interview were tested on a pilot sample of 20 couples recruited from one of the EPAUs.

As a standardised self-report questionnaire, the HADS is widely used to assess psychological distress in nonpsychiatric samples in both primary care and the general population.\(^\text{23}\) It has commendable psychometric properties\(^\text{24}\) and comprises two subscales, one for anxiety (HADS-A) and one for depression (HADS-D). For each subscale of seven items (each of which is scored from 0 to 3), a total score ranging from 0 to 21 can be obtained. A score of 0–7 for either subscale is regarded as being in the ‘normal’ range; a score of 8–10 is suggestive of the presence of moderate levels of anxiety or depression, and a score of ≥11 indicates ‘caseness’, that is where the individual to be examined by an experienced mental health professional, it is highly likely that he/she would be diagnosed to be suffering from an identifiable psychiatric disorder.

#### Procedure

On completion of the management of the index miscarriage, and prior to discharge, women and their partners who met the eligibility criteria (Table 1) were informed by the research midwives about the purpose of the study and issued with a patient information sheet and a consent form, which they were invited to sign and return by post in a freepost envelope to the research midwives. Of the 1443 individuals approached, 686 (40.3%) consented to participate in the study at a female–male ratio of approximately 2:1.
At 1 month after miscarriage, the research midwives telephoned all consenting individuals to arrange a follow-up hospital appointment for the baseline assessment, which comprised the administration of the semi-structured interview and the completion of the HADS for subsequent return in an addressed freepost envelope to the research psychologist.

At 6 and 13 months after miscarriage, follow-up assessments by means of the HADS were conducted. Both these assessment periods were selected in accordance with the recommendation of previous research and clinical practice, which suggests that they signify critical stages in the recovery process. In particular, given the potentially traumatic nature of the event, the latter assessment was chosen to ensure that it avoided the anniversary of the loss. To meet the ethical requirement of ensuring support for individuals who displayed severe reactions at assessment, the data could not be anonymous, but participants were assured of confidentiality. Those individuals identified by particularly high HADS scores (on either subscale) were brought to the attention of one of the authors (D.A.A.) and received a letter from him suggesting that they may wish to contact their GPs. In addition, a copy of that letter, with a covering letter, was sent to the individual’s GP. Forty-three individuals scored at or above the clinical threshold, of whom six displayed sufficiently high levels of anxiety and/or depression to warrant referral to the Regional Traumatic Stress Clinic. On average, each individual was seen for six sessions. Given that this number represented such a small proportion of the overall number of participants, it was not possible to conduct analysis to establish the full extent to which that intervention may have altered their subsequent HADS scores. However, the effect of the intervention on these six participants is unlikely to have had a significant impact on the overall levels of anxiety and depression reported.

Validation of the HADS

The primary objective of conducting the validation of the HADS was to establish the extent to which the HADS, as a self-report measure, corresponded with a ‘gold standard’ by means of a clinical diagnostic interview. Due to a limitation of resources, it was not feasible to conduct a full diagnostic interview on the entire sample. Hence, a pragmatic approach was taken by selecting a randomised sample of 37 participants, which comprised a cross-section of respondents (both men and women) who fell within the three categories of ‘normal’, ‘moderate’, and ‘caseness’. This approach was taken to address the frequent criticism in the literature regarding the limitations associated with relying solely on self-report to establish the level of psychopathology. The interviews were conducted using the anxiety and depression modules from the expanded version of the Composite International Diagnostic Interview (CIDI, version 3.0; World Health Organization [WHO], 1997). The latter enables psychiatric diagnoses to be made according to the Diagnostic and Statistical Manual of Mental Disorders. One author (S.K.) is an accredited WHO trainer for this instrument. To minimise interviewer bias, the specialist registrar in psychiatry was blind to the individuals’ HADS scores. Concordance of caseness/noncaseness ratings between the HADS anxiety and depression subscales and the anxiety and depression modules of the CIDI (version 3.0) was subsequently calculated by means of the kappa coefficient as a chance corrected index of agreement.

Data analysis

The statistical package for the social sciences (SPSS for Windows, version 14.0; SPSS Inc., Chicago, IL, USA) software was used for data analysis. A two-tailed $P$ value $\leq 0.05$ was used to denote statistical significance. Where data were normally distributed with homogeneity of variance, parametric statistical tests were employed, but in the event of skewed distributions and/or heterogeneity of variance, nonparametric methods were used. HADS scores were square root transformed prior to using general linear models to perform repeated measures analysis. These analyses were conducted only for those 406 participants who satisfactorily completed both follow-up assessments. Trends in HADS scores across the three time points and the potential interactions with gender, clinical, and socio-demographic factors were examined.

Results

Recruitment and response rates

A summary of the recruitment and response rates is shown in Figure 1. Of the 1443 eligible individuals invited to take part
in the study, 744 declined to participate and a further 60 withdrew their consent prior to the baseline assessment. A total of 626 individuals proceeded to participate, of whom 400 were women and 226 were men with a mean age of 31.2 years (SD = 5.8, range 16–46) and 33.1 years (SD = 5.8, range 21–53), respectively. Of the 626 participants who completed the baseline HADS assessment, 406 (64.8%) completed the 2 follow-up assessments at 6 and 13 months after miscarriage of which 131 were couples. Completers (n = 406) were significantly more likely than noncompleters (n = 220) to be older (P < 0.001) and to have experienced significantly fewer miscarriages (P < 0.001). Table 2 shows the socio-demographic and clinical profile of women and men who completed both follow-up assessments. By means of univariate analyses, baseline HADS anxiety and depression scores were found to be higher among women with a past medical history of anxiety and depression, respectively, compared with those without. However, the use of general linear models to examine the interaction of each socio-demographic and clinical factor for women and men separately showed that none of these factors had a differential effect on the trends of HADS score over time for either sex (all P > 0.05).

Prevalence of anxiety and depression by gender
Box plots showing the distribution of HADS scores for anxiety and depression at each assessment point are shown in Figures 2 and 3, respectively. At each time point, women reported significantly higher median scores for anxiety and depression than did men (P ≤ 0.001). Within both sexes, there was a significant linear trend in both anxiety and depression scores across the three time points (P ≤ 0.001). For depression, there was a significant gender by time point interaction with women showing a greater improvement in HADS scores over time (P = 0.043).

Prevalence of caseness for anxiety and depression by gender
Based on the HADS total scores at baseline, of the 400 women, 28.3% scored at or above the clinical threshold of 11 (caseness) for anxiety and 10% for depression. The prevalence of caseness for the 226 men was 12.4% for anxiety and 4.0% for depression. Figures 4 and 5 show the trajectory for men and women at baseline, 6, and 13 months in relation to their threshold levels of anxiety and depression, respectively. McNemar’s test was used to determine the change in the level of caseness for anxiety and depression at baseline and 13 months for women and men independently. For women, the levels of caseness for anxiety (P = 0.002) and depression (P < 0.001) were significantly higher at baseline than at 13 months after miscarriage. For men, there were no significant differences between baseline and 13 months in levels of caseness for either anxiety or depression. Age-matched normative data were also presented for comparison (J.R. Crawford, unpublished data).

Validation of the HADS
The cross-validation between the HADS anxiety and depression subscales and the anxiety and depression modules of the
CIDI (version 3.0) showed strong concordance of agreement for case/noncase discrimination with kappa coefficients of 0.786 \((P < 0.001)\) and 0.770 \((P < 0.001)\), respectively.

**Discussion**

This large prospective study represents a systematic attempt to assess the emotional burden of miscarriage on both women and men by identifying the trajectories for anxiety and depression over 13 months following early pregnancy loss.

Overall, our findings verify that miscarriage represents a significant emotional burden for women and, to some extent, for men for at least 13 months after the loss. This emotional burden may in fact be greater because, compared with those subjects who completed HADS scores at all three assessment points, noncompleters (where baseline HADS data only were obtained) scored more highly for anxiety and depression.

The findings from this study are strengthened by its rigorous method and prospective design. More specifically, our recruitment from three EPAUs across Scotland enhanced the representativeness of the sample in relation to the target population. The overall recruitment rate achieved was higher than that reported from a recent national audit of the management of early pregnancy loss conducted under the aegis of the Scottish Programme for Clinical Effectiveness in Reproductive Health,\(^{28}\) and the follow-up response rate at 13 months compares most favourably with, for example Robinson *et al.*\(^{29}\) In accordance with the ethical requirements, it was not possible to ascertain reasons for drop out and to follow up the nonconsenters and noncompleters. The HADS anxiety and depression scores in women and men who dropped out of the study (i.e. completed HADS at baseline only, at baseline and 6 months only, or at baseline and 13 months only) were higher than those from whom data were obtained at all three assessment points thereby suggesting an underestimate of the levels of anxiety and depression reported.

Several literature reviews\(^{5,14}\) claim that an appropriate comparison group is a fundamental aspect of the methodological design of this type of study to ‘…state with any degree of confidence that increased anxiety symptoms experienced after miscarriage are related to reproductive loss as opposed to other factors related to pregnancy in general, or to other factors common in women of reproductive age’.\(^{14}\) A comparison group was not included in our design because it is the implications of the findings for clinical practice, which should be of principal consideration. The fact that a direct causal link cannot (or, indeed, never could) be established with absolute certainty between the miscarriage and subsequent psychopathology experienced is an inevitable feature of this type of research. The use of the HADS, as a standardised self-report measure of general psychopathology, provided the opportunity to compare our prevalence rates of anxiety and depression with other studies and with normative data for the general population.\(^{30}\)
The high level of interrater agreement achieved in the cross-validation of the HADS with a clinical diagnostic interview confirmed the validity of the HADS as a measure of anxiety and depression. Consistent with other studies that have also used the HADS, we found that anxiety rather than depression was more likely to be experienced after miscarriage by women,3,11 and by men.15 Our findings are also compatible with normative data pertaining to the UK, which suggest that anxiety is more prevalent in women than in men in the general population.31 Furthermore, the level of caseness for anxiety was found to be higher at baseline and 6 months than that which has been reported in the general population,30 a finding which is of note because inevitably, according to the probability of miscarriage, some of the female participants in the study by Crawford et al.30 would have experienced early pregnancy loss. However, this increase in caseness was not consistent for female depression. In contrast, a slightly higher proportion of anxiety caseness was found for males in the general population compared with our male participants, while the pattern for depression caseness was less consistent; a finding of interest and worthy of further investigation.

The literature on psychological adjustment following miscarriage is also inconsistent. Prettyman et al.11 found some symptom resolution by 3 months, but this is not confirmed by other studies.32,33 In our study, approximately one-third of women were identified as ‘cases’ (as defined by their HADS anxiety scores at the initial assessment 1 month after miscarriage); a level that confirmed little symptomatic remission 1 year beyond the loss despite the resolution of symptoms for some individuals. Adjustment for women and men followed a different trajectory over the 13 months. While women reported higher levels of anxiety across all three time points (but with a continued improvement within the 13 months), no significant change in anxiety over time was observed for men. A similar trajectory was found for women and men in relation to depression, except that, for men, the level of depression rose slightly by the 13-month follow-up assessment having initially decreased at 6 months after miscarriage. Why these trajectories should have varied cannot be determined from our data but justifies further enquiry. Moreover, our findings do not determine the impact of miscarriage on couples, given that this extended beyond the remit of our study. To do so would require a sufficiently large sample size to permit a matched-pair analysis, given the likelihood that the HADS scores of the female and male partners may change in magnitude and also move in different directions over time.

The relatively high level of anxiety reported in this study by women, and to some extent by men, following miscarriage is of particular relevance for those healthcare professionals who provide after miscarriage care, given that a significant number continued to suffer from anxiety for a considerable time after the event. Those who suffer from an untreated anxiety disorder may experience impaired levels of psychosocial function and an increased risk of developing other psychological morbidity, such as depression.34 Since a high proportion of
women who miscarry are likely to become pregnant again in the months following the index loss, the possible impact of a previous miscarriage on women’s emotional wellbeing during a subsequent pregnancy requires consideration. We were not able to ascertain such an impact because of the burden, which this would have imposed on the participants in terms of completion of the follow-up assessments. A thorough investigation would require additional data pertaining to a number of factors including the outcome of one or more pregnancies (miscarriage or successful pregnancy) and any complications surrounding the delivery and concerns or otherwise of the neonate. The extent to which women who dropped out of the study were likely to have experienced more miscarriages than those who did not is a related factor, which would merit further investigation.

Recent findings from a large UK population-based case-control study have identified anxiety as an independent factor associated with increased risk of first-trimester miscarriage, evidence which further endorses the benefits of early identification and prophylactic intervention. Yet, it would appear that, in the current clinical management of miscarriage, there is a lack of routine follow up. This circumstance may not only increase anxiety in women and men but may also represent an important lost opportunity for healthcare professionals to detect psychological morbidity after miscarriage and treat accordingly.

The Scottish Audit of the Management of Early Pregnancy Loss has recently highlighted the need to train healthcare professionals in the identification and management of the emotional and psychological impact of early pregnancy loss. The ability of healthcare professionals to detect those most at risk of psychopathology following miscarriage would be greatly enhanced by the availability of a brief screening instrument to be used in a clinical setting by nonmental health professionals. Because of the increased likelihood that early pregnancy loss will become a more demanding clinical challenge in the future, due to an increase in the use of fertility services, the identification of those clinical and sociodemographic factors that adversely affect adjustment after miscarriage is urgently required. Accurate identification of individuals at most risk of developing psychopathology and problems of adjustment would ensure the selective use of limited specialist mental health resources. The National Institute for Clinical Excellence Guidelines emphasise that much anxiety goes untreated due to a lack of trained therapists. According to the authors of the recent report by the London School of Economics, about 10 000 more practitioners are required in the UK, and it could take approximately 7 years to train such a cadre. As the nonselective implementation of intervention is neither cost-effective nor efficient, the evaluation of early prophylactic interventions would also be advanced if there were available a brief but valid and reliable method of identifying those at risk.

Conclusion

Our findings verify that early pregnancy loss represents a significant emotional burden for women and to some extent men, in particular with regards to anxiety. Moreover, for many who have experienced miscarriage, the detrimental effects of miscarriage are enduring and display a complex course of adjustment. In terms of providing care for women and men after miscarriage, healthcare professionals need to be cognisant of the adverse effects of early pregnancy loss. Failure to identify those in need of support, and, where appropriate, formal treatment, may leave women and men vulnerable to worsening symptomatology, significant psychosocial impairment, and to an increased risk of experiencing a first-trimester miscarriage in the future.

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References

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