Review article

Affective disorders in the aftermath of miscarriage: A comprehensive review

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Summary

We review the research literature regarding affective symptomatology and disorders following miscarriage, with an emphasis on controlled studies and those that have been published since the last review article in 1996. The current review draws a sharp distinction between controlled and uncontrolled designs and clarifies the proper inferences that may be drawn from each, as only with an appropriate comparison group can it be determined whether the affective reactions following miscarriage are a specific consequence of the reproductive loss or of other life events common in women of reproductive age. In addition to providing an update of the literature on depression in the aftermath of miscarriage and associated risk factors, we also discuss reproductive loss in the context of attachment theory and grief, and present information on topics that were not covered extensively (or at all) by prior reviews, such as issues related to a pregnancy subsequent to miscarriage and the impact of miscarriage on the partners of miscarrying women. In the final section, treatment options relevant to miscarriage are presented.

Keywords: Miscarriage; depression; grief; attachment; risk factors.

1. Introduction

One of the first authors to refer to miscarriage as a traumatic event in a scientific context was a psychoanalyst who described the tremendous emotional consequences of miscarriage when he studied children's reaction to the loss of a sibling (Cain, 1964). Cain delineated the fear, grief, guilt, anger and despair of women who miscarry (Brockington, 1996). For many women, miscarriage constitutes an unanticipated, often physically as well as psychologically traumatic event representing the death of a future child and disruption of reproductive plans. Physiologically, it marks the end of a pregnancy, and psychologically it may produce doubts about procreative competence. As a consequence, miscarriage may increase women's risk for psychiatric symptoms and disorders. A pregnancy following the experience of miscarriage also may be associated with increased stress resulting in elevated levels of distress. In addition, among women with children, miscarriage and the attendant maternal physical and psychological sequelae may interfere with mother-child attachment and may be associated with child behavior problems. Women's partners also can be affected by the loss. Finally, the study of miscarriage as a form of bereavement affords an opportunity to explore yearning and pining for the deceased, as distinct from depressive symptoms, as a cardinal feature of reactions to loss.

2. Current review

There are four key previously published review papers that discuss affective reactions to miscarriage (Frost and Condon, 1996; Lee and Slade, 1996; Slade, 1994; Stirtzinger and Robinson, 1989). The studies elaborated in these prior reviews examined miscarriage, variously defined as involuntary reproductive loss prior to 20 or 28 weeks, with several studies including stillbirth and neonatal death. Among the outcome variables examined in the reviewed studies,

depressive and anxiety symptoms were a major focus. Frost and Condon's (1996) review also included studies of maternal grief, maternal posttraumatic stress disorder and the impact of the loss on other family members. These review articles grouped together studies with and without comparison cohorts unexposed to reproductive loss. The present paper draws a sharp distinction between these two different designs and clarifies the proper inferences that may be drawn from the findings of controlled and uncontrolled studies. Only with a comparison group of women without recent reproductive loss, can it be determined whether the affective reactions following miscarriage are a specific consequence of the reproductive loss. As highlighted below, the current review also covers topics not addressed in the earlier review papers.

The current review discusses all controlled studies of depressive reactions to miscarriage in detail and only refers briefly to uncontrolled studies published since 1996, the date of the last published review paper. We begin with an overview of the general aspects of miscarriage such as prevalence and risk factors, followed by a discussion of loss and subsequent reactions to loss in the context of attachment theory. A brief section discussing methodological issues, such as differences in measurement strategies and timing of assessments following loss that are included in various studies, is presented, followed by a discussion of the importance of including comparison groups. This is followed by the main topic of the review, which includes sections addressing the effect of miscarriage on rates of psychiatric symptoms, psychiatric disorders, and grief. Discussion of depressive symptoms and subthreshold depression, as well as depressive disorders is included to highlight that emotional distress falls along a continuum, and that the entire range has clinical and public health importance. Topics that were not covered extensively (or at all) by prior reviews, such as issues related to a pregnancy subsequent to miscarriage and the impact of miscarriage on the partners of miscarrying women, are presented in a section on other related aspects of miscarriage. In the final sections, treatment options relevant to miscarriage are addressed. Sources referenced in this review were gleaned from extensive *Medline* and *PsychInfo* searches, as well as from the reference lists of published articles in the field.

3. General aspects of miscarriage

3.1 Definition and frequency of miscarriage and stillbirth

Miscarriage involves the spontaneous termination of an intrauterine pregnancy resulting in fetal death. Although clinicians generally define miscarriage as pregnancy ending by 14–16 weeks gestation, research studies have varied widely in how they have operationalized this obstetric event specifically. Still, most research studies define miscarriage as the unintended termination of pregnancy before 20 weeks gestation (Shapiro, 1988), or before 27 completed weeks of gestation (Neugebauer et al., 1992a). The frequency of miscarriage was found to be 14% in a large prospective register linkage study, a finding consistent with earlier work (Kline et al., 1989), with risk varying substantially by age, for example, 9% for women aged 20–24 years, but 75% for women over the age of 45 years (Nybo et al., 2000). Stillbirth, defined as late fetal death with a fetus weighting more than 500 g, is not uncommon with a risk of 0.4–1.2/1,000 in singleton pregnancies (Cotzias et al., 1999; Yudkin and Redman, 2000), and with a higher risk in multiple pregnancies. Some studies have evaluated the psychological effect of stillbirth and neonatal death (Boyle et al., 1996; Clarke and Williams, 1979). Although miscarriage in the first trimester and late fetal loss in the third trimester are part of a continuum of reproductive loss, for the purposes of this review, studies specifically looking at the psychiatric effects of neonatal death and stillbirth are excluded unless otherwise noted, because no controlled studies have been performed. Therefore, whether late fetal loss and specifically stillbirth, are to be distinguished from earlier loss as regards severity, type or duration of psychological sequelae, awaits elucidation.

Miscarriage is not only a psychologically stressful event but in some settings also may pose a serious threat to the life of a woman. Between 1981 and 1991, sixty-two women died in the US following a miscarriage (Saraiya et al., 1999). The risk was greatest for those women who were aged 35 or older, non-White, or with gestational age over 12 weeks. Another study found that the mean annual suicide rate within one year after miscarriage was significantly higher (18.1 per 100.000) than the suicide rates both for women who gave birth (5.9) and for women in the general population (11.3) in Finland between 1987 and 1994 (Gissler et al., 1996).

3.2 Risk factors for miscarriage

In gynecology, the main focus of research on reproductive loss concerns risk factors for miscarriage as well as possible treatment options. The causes typically are classified as genetic, endocrinologic, anatomic, immunologic, or microbiologic. Chromosomal abnormalities in the embryo have been identified as an important cause for first and recurrent miscarriage with the percentage of embryos affected varying from 29% to 57% for recurrent miscarriage (Carp et al., 2001; Stern et al., 1996). Environmental factors, such as caffeine, tobacco/nicotine and other drug use (Abel, 1997; Kline et al., 1991, 1995; Ness et al., 1999), toxins (Borja-Aburto et al., 1999), enzymatic activity (Maccarone et al., 2000), electromagnetic fields (Marcus et al., 2000), a history of multiple induced abortions (Levin et al., 1980) physical effort (McDonald et al., 1986), parental chromosome abnormalities (Tharapel et al., 1985), and stressful life events (Neugebauer et al., 1996) have also been discussed as risk factors in one or more studies. Recurrent pregnancy loss affects 0.5% of women and the causes can be fetal (e.g., chromosomal abnormalities in the embryo) or maternal (Mishell, 1993). Various maternal factors that have been discussed include: uterine abnormalities (congenital or acquired), autoimmune factors such as antithyroid antibodies (Kaider et al., 1999; Meccaci et al., 2000), antiphopholipid antibiodies and alloimmune factors (e.g., natural killer cells, cytotoxic T cells) (Emmer et al., 2000), and embroyotoxic factors and pregnancy loss. Moreover, hypercoaguable states (Blumenfeld and Brenner, 1999), endocrinolocical aberrations, for example, hyperprolactinaemia and hyperandrogenism (Bussen et al., 1999), infections such as HIV (D'Ubaldo et al., 1998), anatomic factors such as polycystic ovaries (Rai et al., 2000), and trace elements, notably folate and homocysteine (Nelen et al., 2000), are discussed in the etiology of recurrent reproductive failures. This paragraph has highlighted all possible risk factors that have been identified in the literature to date; however, an evaluation of how well they have been established as valid risk factors is beyond the scope of this review.

3.3 Loss and reactions to loss as risk factors for adverse reproductive outcomes

Although anxiety and depressive symptoms during pregnancy have not been associated consistently with complications such as intrauterine growth, prematurity, or low birth weight (e.g., Brooke et al., 1989; Lobel, 1994; Perkin et al., 1993; Wadhwa et al., 1993), some studies suggest that such responses may be associated with poor health behaviors during pregnancy (Zuckerman et al., 1989), as well as attachment problems between the mother and child (Cummings and Davies, 1994). These issues have prompted investigations of mothers' adaptation to infants born subsequent to the loss (Agterberg et al., 1997; Davis et al., 1989; Hunfeld et al., 1997; Theut et al., 1992; Wilson et al., 1988). In one study that employed a control group, 27 women with a history of both a pregnancy loss greater than 20 weeks gestation due to congenital anomalies and a subsequent live birth were compared with 29 mothers of newborns without a history of loss (Hunfeld et al., 1997). At 4 weeks postpartum, women with a prior loss experienced greater state anxiety (assessed by the State-Trait Anxiety Inventory (STAI)), depressive symptoms (measured by the Edinburgh Postnatal Depression Scale (EPDS)), and problems with mother-infant adaptation (assessed with the Neonatal Perception Inventory) than women without history of loss. Women in the loss group also held the belief that their healthy infant experienced more problems with crying and with developing stable patterns of eating and sleeping than the average baby.

Additional research should be conducted in this area, as many women with a perinatal loss will go on to deliver a child subsequent to their miscarriage. It is important to study the mental health of these women – not only during the subsequent pregnancy, but also postpartum as depression during pregnancy often extends to this period. Studies investigating the attachment of these mothers to their children also are warranted as attachment might be jeopardized by the possible unstable mental health of the mother after a previous loss (Hughes et al., 2001).

4. General aspects of psychological effects of miscarriage and attachment theory

In contrast to the large body of research on risk for reproductive failure, studies concerning psychological distress in the aftermath of the loss event are sparse. Even though there is a growing body of research stressing the importance of psychological issues post miscarriage, medical interventions are over emphasized. For example, at an extreme level,

a single case study described a woman with 24 miscarriages of unknown cause. The "solution" to her problem, as proposed by fertility specialists, was to implant an embryo in a surrogate mother. In this report there is no mention of the psychological response that followed the multiple losses or the psychosocial implications of the "solution" to the problem (Raziel et al., 2000).

Robinson et al. (1999) have proposed that psychological reactions to perinatal loss are best understood when viewed through the framework of attachment theory (Bowlby, 1969). This theory is based on the central role of attachment in human relations. It posits that the development and loss of attachment bonds – through pregnancy and perinatal bereavement, for example – are followed by a range of psychological reactions. However, the stages and mechanisms by which this attachment process progresses are by no means self-evident. On common sense grounds, we would expect that maternal attachment to the unborn child would increase with later gestational age. Certainly, it is reasonable to anticipate that fetal movement, which can be detected by women as early as the 16th week of gestation, would be associated with an incremental increase in attachment. The underlying assumption here is that gestational age, degree of attachment and hence the corresponding intensity of loss, are directly related.

The relationship between length of gestation and level of psychological distress after perinatal loss was first studied by Peppers and Knapp (1980). They evaluated 65 women who had miscarried, had a stillbirth or lost a neonate. They confirmed a prior finding by Kennell et al. (1970), who studied 20 women who had lost neonates, that maternal grief is unrelated to the length of the baby's life. They extended these results to prenatal loss as well. Similarly, several large studies found no increase in psychological symptoms with advancing gestational age (Kirkley-Best, 1981; Klier et al., 2000; Neugebauer et al., 1997; Thapar and Thapar, 1992). However, Janssen et al. (1996b) found that among miscarrying women, length of gestation was positively associated with depressive symptoms at 12 months after loss. The explanation for these inconsistent findings awaits clarification.

Recent advances in medical technology may have altered the natural history of prenatal maternal attachment. For example, the frequent use of ultrasound creates an opportunity for the woman and her partner to see their child before birth. Ultrasound may afford an opportunity, therefore, for the development of earlier or more intense prenatal maternal attachment than had been possible previously. However, despite the greater objective reality conferred upon the unborn child by experience of ultrasound visualization, several lines of evidence suggest that its impact on attachment per se may be limited. For example, Beutel et al. (1995a) found that even when a viable pregnancy could not be verified independently, the fetus had achieved mental representation in most women by 10 weeks as evidenced in dreams, daydreams, internal dialogues, and preparations for the child's arrival. Similarly, Ritsher and Neugebauer (2001) report no association between the use of ultrasound and the level of grief and yearning after miscarriage. Evidently, the effect of ultrasound on maternal attachment and the possible influence of ultrasound on bereavement reactions after perinatal loss await further systematic investigation.

Attachment and infant mental health specialists are beginning to discuss the impact of perinatal loss for both parents, and the implication of the loss for other parent-child relationships in the family, especially infants born subsequent to the loss (Zeanah and Harmon, 1995). This area warrants further study, particularly as it offers a unique opportunity to investigate the merits and assumptions of attachment theory.

5. Methodological issues in the study of affective reactions to miscarriage

A comprehensive literature review on the sequelae of miscarriage is challenging due to the variations in the definition and measurement of mental health outcomes, the timing of study assessments after loss and selection of proper control groups (or most crucially, the absence of control groups altogether). Each of these issues is addressed in this section.

5.1 Measures of psychiatric symptoms and disorders

Some studies in this field assess the level of psychiatric symptoms after loss, whereas others provide rates of specific psychiatric disorders. As has been noted by Slade (1994) and Klier et al. (2000), depressive symptoms and subthreshold depression both have clinical as well as public health importance and therefore evaluation should not be restricted to establishing psychiatric caseness. To do so would

neglect the fact that emotional distress falls along a continuum rather than constituting a dichotomy. Failing to reach the threshold for caseness does not imply that an experience has had no significant impact on the person's subjective distress and social functioning. Studies that report on symptoms and disorders are both important, albeit their findings cannot be compared directly.

Most of the self-report questionnaires or rating scales that have been employed are well-known and widely-used measures for assessing depressive symptoms. These measures include the Beck Depression Inventory (BDI; Beck, 1961), the Center for Epidemiological Studies - Depression Scale (CES-D; Radloff, 1977), the Clinical Self-Rating Scale (CSRS; von Zerssen, 1986), the General Health Questionnaire (GHQ; Goldberg, 1972), the Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983), the Symptom Check List (SCL-90; Derogatis et al., 1973), and it's revision (SCL-90-R; Derogatis, 1975). In general, self-report questionnaires have been used most often because they are a more cost-effective way to evaluate more women. Few studies assessing the presence of affective disorders have used a structured or semi-structured clinical interview. When employed for this purpose, the interview measures used have included the Present State Examination (PSE) (e.g., Friedman and Gath, 1989), the Diagnostic Interview Schedule (DIS) (e.g., Klier et al., 2000; Neugebauer et al., 1997), or the Diagnostic and Statistical Manual of Mental Disorders criteria (DSM-III-R), (e.g., Garel et al., 1992; Lee et al., 1996). Although the data from all studies cannot be compared directly due to the use of different assessment tools and collection strategies, there have been some reliable methods of assessing symptoms and diagnoses that have been used consistently.

5.2 Timing of symptom measurement

Across the different studies, depressive symptoms or episodes have been assessed in women mainly at the following times: within the first 2 weeks after loss (Beutel et al., 1995a; Cecil and Leslie, 1993; Garel et al., 1992; Neugebauer et al., 1992b; Prettyman et al., 1993; Seibel and Graves, 1980; Thapar and Thapar, 1992), at 4 weeks (Friedmann and Gath, 1989), 6 weeks (Neugebauer et al., 1992a; Prettyman et al., 1993; Thapar and Thapar, 1992), at 2–5 month (Garel et al., 1992; Janssen et al., 1996b; Stritzinger et al.,

1999; Swanson, 2000; Tunaley et al., 1993) or at 6 months (Beutel et al., 1995a; Janssen et al., 1996b; Klier et al., 2000; Lee et al., 1997; Neugebauer et al., 1997; Robinson et al., 1994). Some studies assess women as late as 8 months (Garel et al., 1992), 1 year (Beutel et al., 1995a; Janssen et al., 1996b; Robinson et al., 1994; Stirtzinger et al., 1999; Swanson, 2000), and 18 months and 24 months (Cordle and Prettyman 1994; Janssen et al., 1996b) after miscarriage. This wide range of timing of evaluation across studies again complicates comparison of results, but also highlights that psychological effects of miscarriage are assumed to impact women's well-being on a short term as well as long term basis.

5.3 Proper interpretation of findings:
The essential role of comparison groups
unexposed to reproductive loss

The study design employed in an investigation largely determines how the data can be interpreted and to who study results can be generalized. When evaluating the consequences of an event such as miscarriage, it is vital to assess whether the observed reactions are actually related to the specific event, as opposed to some other general factors. To say that rates of the observed phenomenon, such as depressive symptoms, are "significantly elevated" for women exposed to loss is only meaningful when compared with observations of the same phenomenon in a similar group unexposed to the event.

Prior studies of the psychiatric effects of miscarriage fall into two broad categories: on the one hand, studies restricted to a cohort or group of miscarrying women and, on the other, studies that include, in addition to the miscarriage cohort, a comparison cohort of women without recent, or any exposure to, reproductive loss. The former group of studies reports the level of depressive symptoms or rates of affective disorder in the miscarriage cohort alone. The latter group of studies also reports symptom levels or rates of disorder among the miscarriage cohort but includes as well a comparison of these levels or rates with those in the comparison cohort.

The inferences that can be drawn from these two types of studies, and more precisely, from within-cohort analyses and across-cohort analyses, are markedly different. The findings also serve different clinical and epidemiological purposes. Analyses of symptom levels in a miscarriage cohort convey the magnitude of psychiatric disturbance in this group

and should guide allocation of mental health resources and expertise for their care. However, in the absence of a comparison group comprised of otherwise similar women who have not miscarried, it cannot be determined whether the symptom levels or rates of disorder in the miscarriage cohort are characteristic of women of reproductive age generally or is a specific consequence of their recent reproductive loss. Thus, the effect of miscarriage per se, as distinguished from the level of psychological distress among miscarrying women, is unknowable in the absence of a comparison group. It is noteworthy that the distinction between these two types of studies and their corresponding strengths has not always been appreciated in the perinatal bereavement literature.

The fundamental difference in these two study designs also has implications for the proper inferences that can be drawn regarding the role of other factors, such as maternal age, attitude towards the pregnancy, or gestational length at time of loss, in psychological reactions to loss. For example, a finding that older miscarrying women have higher levels of depressive symptoms than younger miscarrying women indicates only that older miscarrying women may be more in need of psychiatric care than younger women. This finding does not demonstrate, nor does it necessarily even suggest, that miscarriage exerts a more powerful effect on older women as compared with younger women. Older women of reproductive age may have more elevated depressive symptom levels generally, compared to younger women of reproductive age. If, for example, the level of depressive symptoms does not vary with maternal age in a comparison cohort who have not miscarried, and is lower than levels seen in the miscarriage cohort, we conclude that age moderates the effect of miscarriage on depressive symptoms so as to reduce its impact on younger women (or alternatively, enhance its effect on older women). No such inference is possible in the absence of a comparison group.

The first researchers in the field to include a control group were Clarke and Williams (1979). They studied depression in women who gave birth to a live child compared to those who suffered a perinatal death. Regarding miscarriage, Neugebauer et al. (1992a,b) and Thapar and Thapar (1992) utilized a comparison group of pregnant women to distinguish the impact of loss from the impact of pregnancy itself. Two studies used a community control group

unexposed to any reproductive event in addition to the pregnant control group (Beutel et al., 1995a; Neugebauer et al., 1992a,b) to further clarify the overall psychological impact of miscarriage, with and without the contribution of pregnancy, on observed symptom levels in women experiencing early reproductive loss.

Some uncontrolled studies also have been performed since 1996 (i.e., Lee et al., 1996; Lee et al., 1997; Nikcevic et al., 1999b; Stirtzinger et al., 1999; Swanson, 2000). Due to their limited study design, no conclusions can be drawn. However, Swanson (2000) introduced some interesting possible "risk factors" as opposed to merely reporting elevated symptoms in miscarrying women following loss. She concluded that high personal significance of the miscarriage, lack of social support, lower "emotional strength" (related to self-esteem), use of passive coping strategies, lower income and not having conceived or given birth one year after the miscarriage, represent factors which may predict depressive symptoms. These potential risk factors warrant investigation in future controlled studies.

6. Studies of miscarriage cohorts using comparison cohorts comprised of women without recent reproductive loss, 1992–2001 (see Table 1)

This section covers studies published between 1992 and 2001, the time period when controlled studies in the field began being conducted. This phase represents an important change when some researchers began to broaden their focus on clinical findings to include epidemiological studies that employed appropriate comparison groups. Furthermore, some researchers began to recognize that where necessary, multivariate statistical procedures should be employed to control for initial group differences at baseline. With the exception of Thapar and Thapar (1992), the five studies that will be reviewed in this section display all of these positive features, which we see as suggested guidelines for future studies.

6.1 The effect of miscarriage on rates of depressive symptoms

Neugebauer et al. (1992a, b) assessed miscarrying women at 2 weeks, 6 weeks and 6 months after loss. Levels of depressive symptoms in this group were compared with those among pregnant women (with the 2 week assessment only) and community women

Table 1. *Studies examining the effect of miscarriage on level of depressive symptoms and rates of depressive disorder employing comparison cohorts unexposed to reproductive loss*

Author	Outcome Measure(s) [1]	Study Cohorts (Initial sample sizes)	Time-point of Assessment Post-Miscarriage	Results			
PSYCHIATRIC SYMPTOMS				1st Assessment	2nd Assessment	3rd Assessment	4th Assessment
Neugebauer et al. (1992a)	CES-D	Miscarriage (382) [2] Pregnant (283)	2 weeks 6 weeks 6 months	↑	↑[2,3]	↑[2,3]	NA
		Community (318)		↑	↑[2,3]	↑[2,3]	NA
Thapar and Thapar (1992) [4]	HADS	Miscarriage (60) [4] Pregnant (62)	Within 24 hours 6–8 weeks	=	=	NA	NA
	GHQ (Severe Depression subscale)			↑	↑	NA	NA
Beutel et al. (1995a, 1996b)	CSRS (DS subscale)	Miscarriage (125) [5] Pregnant (80) [5]	Within 1–2 days 6 months 12 months	↑	[7] =	=	NA
		Community (125) [6]		↑	↑	↑	NA
Janssen et al. (1996)	SCL-90	Miscarriage (227) Pregnant (213)	2.5 months 6 months 12 months 18 months	↑	↑	=	=
PSYCHIATRIC DISORDERS				1st Assessment	2nd Assessment	3rd Assessment	4rd Assessment
Neugebauer et al. (1997)	DSM-III-R, Major depressive episode	Miscarriage (229) Community (230)	6 months	↑	NA	NA	NA
Klier et al. (2000)	DSM-IV, Minor depressive episode	Miscarriage (229) Community (230)	6 months	↑	NA	NA	NA

↑ significantly higher symptom level or disorder rate in the miscarriage cohort relative to the comparison cohort = symptom level or disorder rate does not differ between the miscarriage cohort and the comparison cohort NA Not Applicable (i.e., no additional assessments were made).

[1] Please see text for full name of outcome measures.

[2] Refers to the number of miscarrying women who were evaluated at least once during the three assessment points. (Number of women who were first interviewed at: 2 weeks = 232; 6 weeks = 114; 6 months = 36).

[3] These results pertain to miscarrying women first interviewed at this time point. However, among miscarrying women being reinterviewed at this time point, symptom levels did not differ from those in the community cohort, with the latter findings considered as possibly attributable to an unintended therapeutic effect of the study interviews and to test effects.

[4] At the second assessment the miscarriage cohort included 51 women, the pregnant cohort, 52 women.

[5] At the second assessment, the miscarriage cohort included 94 women, the pregnant cohort, 66 women. The corresponding numbers for the third assessment were 90 and 66, respectively.

[6] Symptom data on the community cohort was derived from the findings from another independent study conducted by a separate team of researchers.

[7] Results for the 6 month assessment are presented in a German publication (Beutel, 1996b).

not recently pregnant. Owing to difficulties in establishing an initial contact, some miscarrying women were first assessed only at 6 weeks, others, only at 6 months. Depressive symptoms were measured with the CES-D scale to assess depressive symptoms. Depressive symptom levels were markedly elevated among miscarrying women, relative to the other cohorts, at 2 weeks after loss: 3.4 times that of pregnant women and 4.3 times that of community women. Among miscarrying women first interviewed at 6 weeks and those first interviewed at 6 months, depressive symptom levels were 2.6 and 3.0 times that of community women, respectively. However, among miscarrying women re-interviewed at these time points, symptom levels did not differ from those in the community cohort, a result considered as possibly attributable to the unintended therapeutic and test effect of study interviews.

Thapar and Thapar (1992) assessed women at 24 hours and six weeks after miscarriage, comparing them with pregnant controls. Depressive symptoms were assessed with the HADS and with the Depression Subscale of the GHQ. Depressive symptom levels, as measured by the GHQ, were elevated among the miscarrying women at both assessments, compared to the levels in the pregnant comparison cohort. By contrast, depressive symptom levels on the HADS were not elevated at either time point among the miscarrying women overall as compared with the pregnant women.

Beutel et al. (1995a) compared the level of depressive symptoms, as measured by the Depression Scale (D-S), which is part of the CSRS (von Zerssen, 1986) in a cohort of miscarrying women with symptom levels in two other cohorts, pregnant women and community women. The miscarrying women were assessed within 1–2 days of miscarriage and then at six and twelve months. Within 1–2 days after loss, depressive symptom levels were elevated among the miscarrying women as compared with both the community and pregnant cohorts. At 6 and 12 months they only differed from community women, but not from the pregnant control.

Janssen et al. (1996b) assessed psychological symptoms in a cohort of 2,140 women early in pregnancy. Thereafter, the symptoms of women who went on to miscarry before 20 weeks gestation (n = 227) were assessed at 4 time points after the loss (2.5, 6, 12 and 18 months). The symptoms of the subsample of women who had live births (n = 213) were assessed one more time during pregnancy, at 6 months, and then 1 month after birth. Miscarrying and postpartum women were assessed for depression, anxiety, somatization symptoms and obsessive-compulsive behavior on the SCL-90. At 2.5 and 6 months after miscarriage, miscarrying women scored significantly higher on all four subscales than the group of women who had a live birth and were assessed one month after delivery. At twelve months, the mental health of women who experienced a pregnancy loss no longer differed from women who gave birth to a living baby.

In summary, these five studies consistently show an increase in affective symptomatology in women who have experienced a miscarriage in comparison to the particular control groups employed. The next question that arises is whether these elevated rates of depressive symptoms translate into diagnosable DSM disorders. As both depressive symptoms and disorders are elevated in women following miscarriage, whether or not symptoms translate into diagnosable DSM disorders, further development of appropriate screening tools and mental health referral protocols, as well as new interventions specific to this population, are needed. Efforts toward the development of such work have been successful in the field of postpartum mental illness during the past several years.

6.2 The effect of miscarriage on rates of psychiatric disorders

Whereas there are five controlled studies on affective symptoms, only two studies have assessed affective disorders following miscarriage. To date, Neugebauer et al. (1997) and Klier et al. (2000) are the only controlled studies to compare rates of affective disorder in a miscarriage cohort with rates in a comparison group of women unexposed to reproductive loss. Neugebauer et al.'s (1997) cohort study compared the risk of major depressive disorder among women following miscarriage (defined as loss before 28 completed weeks gestation) with that among women who had not been pregnant in the previous year. A sample of miscarrying women who were attending a medical center for a spontaneous abortion and a matched comparison group of women drawn from the community were evaluated for major depressive disorder using the DIS. The overall risk for an episode of major depressive disorder among the miscarriage cohort was 2.5 times that of the community cohort (95% confidence interval (CI)

1.2–5.1); specifically, 10.9% of miscarrying women experienced an episode of major depressive disorder compared with 4.3% of community women.

Although minor depressive disorder is of considerable clinical and public health importance, it has received limited research attention as compared with major depressive disorder. A study by Klier et al. (2000), based on the same sample of miscarrying and community women evaluated in the Neugebauer et al. (1997) study, tested the hypothesis that miscarrying women are at increased risk for an episode of minor depression as defined by DSM-IV diagnostic criteria (Appendix B, research criteria) in the 6 months following loss. Among miscarrying women, 5.2% experienced an episode of minor depression, compared with 1.0% of community women. The overall relative risk for an episode of minor depression for miscarrying women was 5.2 (95% CI 1.2–23.6). Future work addressing depressive symptoms and disorder also must address any overlap with anxiety symptoms (e.g., see Castille et al., in preparation).

7. Risk factors and predictors in controlled studies

Controlled studies demonstrate convincingly that early reproductive loss raises the level of psychiatric symptoms and increases the risk of psychiatric disorders in women who miscarry. Identification of maternal characteristics that place certain miscarrying women at especially elevated psychiatric risk also is important from both a clinical and public health perspective. In this context, it is crucial to emphasize again the difference between the clinical and epidemiological perspectives. For example, from a clinical perspective, it is important to know which individual miscarrying patients are likely to later experience substantially elevated levels of depressive symptoms. Epidemiologic studies, however, aim to identify the distribution of depression in miscarrying women relative to the population unexposed to this event, as well as identify factors that may modify their risk, such as age, marital status and maternal attitude towards the pregnancy. Clearly, such epidemiologic investigations can help inform health care providers treating individuals.

7.1 Demographic variables as effect modifiers: Women's age, number of living children, marital status, occupational status, social class

Demographic variables have been evaluated as possible modifiers of the association between miscarriage and affective reactions. Variables such as age, occupational status and social class were not found to be associated with psychological problems after miscarriage in those controlled studies which included a comparison group in the analyses (Neugebauer et al. 1992b; Neugebauer et al. 1997; Klier et al. 2000). Whereas the results of uncontrolled studies are inconsistent regarding their report of the risk of marital status on depression, all three controlled studies that systematically assessed marital status found no elevated risk for single or married women (Klier et al., 2000; Neugebauer et al., 1992b; Neugebauer et al., 1997). The two controlled studies that also evaluated the possible contribution of childlessness to depressive symptoms or disorder following miscarriage reported that the overall effect of miscarriage was substantially worse among childless women (Neugebauer et al., 1992b; Neugebauer et al., 1997). For major depressive disorder in particular, the relative risk was substantially higher for childless women (RR = 5.0; 95% CI, 1.7–14.4) than for women with children (RR = 1.3; 95% CI, 0.5–3.5).

7.2 Personal psychiatric history

Neugebauer et al. (1997), in a controlled study, confirmed that prior affective symptomatology is a risk factor for major depression following miscarriage. They found that among miscarrying women with a history of major depression, 54% experienced a recurrence (Neugebauer et al., 1997). The other controlled studies did not assess this factor.

7.3 Reproductive history

Another maternal characteristic that may place certain miscarrying women at especially elevated psychiatric risk is reproductive history. Specific factors that have been evaluated include the duration of pregnancy when the loss occurs, maternal attitude toward the pregnancy, and history of previous losses through miscarriage, stillbirth or elective abortion.

7.3.1 Length of gestation at time of loss

The five controlled studies that looked at the impact of gestational age at time of loss on depression, and included a pregnant control group, report conflicting results. Two studies found the length of gestation positively related to risk of depression (i.e., Janssen et al., 1996b; Neugebauer et al., 1992b), whereas Thapar and Thapar (1992) found the length of gestation negatively related to risk of depression. One factor limiting the results of Thapar and Thapar (1992) is that median symptom scores on the GHQ and HADS for the miscarriage and comparison groups according to gestational age are only reported for the initial assessment (i.e., within 24 hours of evacuation of the uterus or registration at the obstetric clinic). Although available, such findings are not reported for the six-week follow-up, thus precluding evaluation of the association between length of gestation and risk for depression at that later time point. Neugebauer et al. (1997) and Klier et al. (2000) found no association between duration of pregnancy and risk for major or minor depressive illness.

Neugebauer et al. (1992b) is the only research team to date to compare an early and late loss sample of miscarrying women with pregnant women at early and late gestation respectively. Miscarrying women at later stages of gestation showed marginally significant higher depressive symptom scores than women who miscarried early. Early in gestation, the level of depressive symptoms between miscarrying and pregnant women did not differ. By contrast, later in gestation, the level of depressive symptoms was higher among miscarrying women as compared with pregnant women.

Some research indicates that miscarriage has a greater effect on women later in gestation compared to those earlier in gestation, relative to what their symptom levels would have been had they remained pregnant. Using a within-group study design, Janssen et al. (1996b) found that those women still depressed at one year post-miscarriage could be discriminated from those no longer depressed by the length of gestation at time of loss. On the contrary, Thapar and Thapar (1992) calculated the influence of gestational age in women with early miscarriage (<16 weeks) versus women with later miscarriage (>16 weeks) and compared them to an antenatal group of un-specified pregnancy duration. Although limited by a small sample size, they found that women with early

pregnancy loss had higher depressive scores than those with later pregnancy loss. However, an interpretation is not possible if miscarrying and pregnant women are not examined separately in early and late gestation. Beutel et al. (1996a) did not assess the relationship between gestational age and levels of depression.

7.3.2 Maternal attitude toward the pregnancy

Until now, results of studies investigating factors relating to pregnancy such as ambivalence or nega-tive feelings towards pregnancy, as well as whether the pregnancy was planned and wanted, have been inconsistent. Neugebauer et al. (1992b) showed that miscarriage had a greater impact on women who had a wanted pregnancy compared to those who had unwanted pregnancies.

Beutel et al. (1995a) conducted within-group analyses as opposed to between-group analyses when evaluating maternal attitude toward the pregnancy as a possible risk factor for depression. Even though within-group analysis does not provide conclusive answers regarding elevation of risk, Beutel et al.'s work still can offer some interesting, albeit limited, information regarding maternal attitudes toward pregnancy. When comparing grieving women to depressed women they found that ambivalence towards the pregnancy was associated with de-pressive symptoms rather than grief, assessed by a multidimensional grief scale. Beutel et al. (1995a) also addressed whether dissatisfaction with social support was a risk factor for affective disturbance. They found that dissatisfaction with the partner's support was associated with heightened risk for depression in the within-group analyses. However it is possible that the woman's depression could have prompted her to negatively evaluate her partner's support rather than poor support causing the woman to become depressed. Only if compared to a pre-gnant or community group could this factor be attributed to the heightened risk.

7.3.3 History of prior loss: Recurrent spontaneous abortion

Several studies have examined the psychological impact of prior loss on a subsequent miscarriage. Two studies that investigated a history of elective abortion as a potential effect modifier for elevated psychopathology post loss, found no association

(Klier et al., 2000; Neugebauer et al., 1997). All but one controlled study evaluated psychological outcome following a first or recurrent miscarriage. None of these studies found an elevated risk for depressive symptoms or disorder for women with recurrent miscarriages relative to a single miscarriage. Klock et al. (1997) addressed this issue in a case series of 57 women with recurrent miscarriages (i.e., three or more consecutive spontaneous abortions) using the BDI, and the STAI, as well as measures of self-esteem, locus of control and dyadic adjustment. Thirty-two percent of the women were classified as depressed based on their BDI scores. A comparison group consisting of women with only one miscarriage was not employed, so conclusions cannot be drawn from this study.

In summary, other than childlessness, demographic factors studied thus far do not seem to play a major role in the psychological sequelae of miscarriage. Previous pregnancy loss does not seem to be a factor influencing heightened risk. However, regarding attitude towards the pregnancy – including negative feelings – and the gestational stage of the pregnancy, the results are still inconsistent.

8. Grief

Although sadness is certainly a major aspect of bereavement, several authors have argued for the importance of studying grief, or more specifically, yearning and pining for the lost attachment figure (Beutel et al., 1995a; Bowlby, 1969, 1980; Elders, 1995; Jacobs et al., 1987; Prigerson et al., 1995). The literature typically subdivides the bereavement experience responses into three parts: (1) shock and numbness, (2) yearning for and preoccupation with the deceased, and (3) depression and disorganization (e.g., Bowlby, 1980; Clayton, 1982, 1998; Elders, 1995; Jacobs et al., 1987). More recently, a fourth group has been included: anxiety (Jacobs et al., 1990; Surtees, 1995). Researchers in the field currently are trying to determine whether grief and depression are most parsimoniously viewed as separate or overlapping entities, or as different terms for the same construct. Such a distinction would be important if grief and depression were differentially related to long-term adjustment. For example, screening tools that measure depression but not grief may underestimate individuals' risk of long-term impairment.

Proposals by Prigerson and colleagues (1999) for recognition of a new diagnostic entity called "traumatic grief" represent an attempt to formally classify grief separately from depression. As proposed, traumatic grief constitutes a syndrome distinct both from normal grief and from posttraumatic stress disorder (PTSD), with the stressor explicitly identified as the traumatic loss of an attachment figure (Prigerson et al., 1999). The specific components of traumatic grief that differentiate it from depression include yearning for the deceased and feeling "stunned" (Prigerson et al. 1995). Studies of traumatic grief suggest that it significantly enhances risk for suicidal behavior and heart disease even after controlling for depressive symptoms (reviewed in Prigerson et al., 1999). These findings underscore the value of examining the potential contribution of yearning – a primary element distinguishing traumatic grief from depression – to psychiatric and physical morbidity and possibly even mortality subsequent to the loss.

8.1 Measures of perinatal grief

Several scales, designed to measure grief defined in the manner discussed above, have been developed that refer specifically to perinatal bereavement, which is a major advance in a field long plagued by weak research methodology (Janssen et al., 1996a). The Perinatal Grief Scale (PGS) measures a wide range of reactions to perinatal loss, including depression, anger, social functioning, spirituality, desire for counseling, locus of control, and guilt (Potvin et al., 1989; Toedter et al., 1988). The PGS is based on items from the Texas Grief Inventory (TGI; Zisook et al., 1982), and contains three subscales: Active Grief, Difficulty Coping, and Despair. However, each of these subscales contains items seemingly assessing depressive symptoms (such as "I feel depressed"), thereby precluding measurement of grief, in the form of preoccupation with the loss, separate from depression (Potvin et al., 1989). To make a version of the PGS that was less focused on a "baby" and thus more suitable for studying miscarriage, Nikcevic et al. (1999a) again used the TGI to develop and validate a 17-item scale, which also contains depression-related items.

In an effort to disentangle unique aspects of grief from depression, Beutel and colleagues (1995b) developed the Munich Grief Scale (MGS) – a shortened version of the PGS. Although the MGS has good reliability and validity (Beutel et al., 1995b), one subscale, "Traurigkeit" [sadness], does seem to

measure aspects of depression, such as crying. Nevertheless, they found evidence supporting a distinction between grief and depression reactions, as measured both cross-sectionally and longitudinally in their controlled 1-year follow-up study (Beutel et al., 1995a).

The Perinatal Bereavement Grief Scale (PBGS; Ritsher and Neugebauer, 2002) is intended to measure yearning for the lost pregnancy and anticipated child. Psychometric analyses support the scale's reliability and validity. In particular, factor analysis results indicated that this construct is distinct from the more general phenomenology of depression. In the study population, the cross-cultural validity and reliability of the PBGS was acceptable whether tested by language (Spanish v. English) or ethnicity (Hispanic v. other).

Yearning is of potentially equal or greater prognostic value than depression level as regards long term adjustment following bereavement. Research on adult conjugal bereavement has implicated preoccupation with the deceased and searching and yearning for the deceased as predictive of long-term functional impairment (Prigerson et al., 1995). Now that reliable measures of perinatal grief are available, such questions are ripe for investigation and likely to yield clinically useful results. Some have already been investigated in rigorous studies, as reviewed below.

8.2 Predictors of grief reactions to perinatal loss

The level of yearning on the PBGS tended to be higher among women who were invested in the pregnancy, as evidenced by thinking of a name for the baby, having thought of the loss as that of a baby, having bought things for the baby, or having made changes in their homes. Furthermore, those who had felt the fetus move inside them (quickening) also experienced greater yearning (Ritsher and Neugebauer, 2002). Similarly, Hutti (1992) found a positive relationship between the perceived reality of the pregnancy or baby and the level of grief.

Beutel and colleagues (1996a) found that miscarrying patients who had both high depression scores and high grief scores immediately after their miscarriage were likely to report continued depression, anxiety, guilt, and anger at a one-year follow-up.

Several investigators (Goldbach et al., 1991; Janssen et al., 1997) have reported that gestational age was related to grief scores, such that women who had been pregnant longer experienced stronger grief. However, this was not the case in Ritsher and Neugebauer's work (2000) in covariate-adjusted analyses of PBGS data from 3 time points.

In a study with clear clinical implications, Nielsen and colleagues (1996) compared miscarriage treatment regimens (dilation and curettage versus expectant management) and found no differences in grief reactions.

In summary, the literature on grief reactions to miscarriage shows that it is psychometrically feasible, theoretically sound, and clinically useful to view grief as a reaction to miscarriage that is distinct from depression, albeit frequently co-occurring with it. Next, we turn to other distinct but related factors worthy of further study.

9. Other related aspects of miscarriage

This section highlights issues relevant to psychological reactions following miscarriage that have not been reviewed in prior articles, and although not the main focus of the current review, are nonetheless of clinical importance and research interest. First the possible consequences for women who experience grief and affective problems following a miscarriage and who become pregnant again is reviewed. As many women who experience a loss will go on to conceive again, these issues, as well as whether miscarrying women should be advised to wait prior to attempting subsequent conception warrant further study. Next, the little-researched topic of the impact of the reproductive loss on the partners of miscarrying women will be addressed.

9.1 Affective psychological sequelae of perinatal loss and the subsequent pregnancy

Many women who miscarry become pregnant again in the months following loss. In one report, over 86% of 221 women who lost a child by miscarriage (approximately 85%) or perinatal death (approximately 15%) conceived again within a year and a half following loss (Cuisinier et al., 1996). Of these 221 women, 19% were pregnant again at 2.5 months post-loss and the majority of women (63%) were pregnant again at 6 months following loss. The question arises therefore as to the possible impact of miscarriage on women's mental health during the subsequent pregnancy, especially if the next preg-

nancy occurs relatively quickly after loss. These concerns have prompted recommendations that miscarrying women wait until the psychological effects of the loss are overcome prior to attempting to conceive again (Forrest et al., 1982; Hughes et al., 1999; Lewis, 1979), although the value of this recommendation is unclear and debate continues.

9.1.1 Grief and the subsequent pregnancy

Systematic study of the effect of reproductive loss on subsequent pregnancies is comparatively sparse. Some researchers have found that grief levels decrease substantially as a result of a subsequent pregnancy (Cuisinier et al., 1996; Lin and Lasker, 1996). Using the short form of the PGS (Potvin et al., 1989), Cuisinier and colleagues (1996) found that a subsequent pregnancy for women who have had a recent loss reduces the grief experienced following loss about as much as the passing of 8 months without a new pregnancy. If the subsequent pregnancy results in a new loss, the intensity of grief experienced is increased to a comparable degree. Cuisinier et al. (1996) further reported that the effect of time of onset of the subsequent pregnancy is relatively equivalent to the lapse of time since the loss, such that getting pregnant one month sooner has the same impact on grief as the passing of one month since the loss. Lin and Lasker (1996) assessed grief using the short form of the PGS at three points over the course of 2 years following reproductive loss (i.e., at two months, 1 year and 2 years following loss). Of the 138 women who participated in the first interview, 46% had experienced a miscarriage, 13%, an ectopic pregnancy, 28%, a fetal death, and 13%, a neonatal death. Although they found a normal decline of grief, with the greatest decline during the first year, Lin and Lasker (1996) identified 4 primary grief patterns when cases were considered individually: Forty-one percent displayed the "normal" expected decline in grief over time, while 13.1% displayed a "reversed" pattern, 17.2% displayed a "delayed resolution," and 28.7% displayed a "low unchanged" grief pattern. Lin and Lasker (1996) reported an association between subsequent pregnancies and births, and declining grief scores over time, and discuss how living children may help with grief. They highlight however, that although a subsequent pregnancy or birth may help lessen the grief reaction, grief is not necessarily resolved by these events, as all groups maintained a certain mean level of grief symptoms even two years post-loss.

Timing of loss also may influence the experience of grief during a subsequent pregnancy. Using Theut et al.'s 26-item Perinatal Bereavement Scale to assess grief reactions within 6 weeks after the birth of a subsequent child in a sample of 25 couples that had experienced a perinatal loss, Theut et al. (1989) reported that the 36% of parents who had experienced a "late loss" (including stillbirth or neonatal death) grieved more than the 64% who had experienced an "early loss" (miscarriage prior to 20 weeks gestation). Overall, parents grieved less after the birth of a healthy child. In a follow-up study, Theut et al. (1990) reported that "late loss" mothers continue to display significantly higher grief scores at 16 months after the birth of the subsequent child than the "early loss" mothers or fathers, and that these late loss mothers appear to have a more gradual resolution of grief than early loss parents. Although more research is needed in this area, it seems that gestational age at time of loss may influence the extent of grief reactions, and that giving birth to a healthy infant may limit grief reactions to some degree.

9.1.2 Depression in the subsequent pregnancy

Some studies have examined depressive symptoms in the pregnancy subsequent to perinatal loss (Carrera et al., 1998; Franche and Mikail, 1999; Hughes et al., 1999; Theut et al., 1988). Those that employed a comparison group have reported mixed results as to whether depressive symptoms are increased in the subsequent pregnancy. For example, Theut et al. (1988) compared 25 expectant couples with a history of perinatal loss within the previous 2 years (64% had experienced miscarriage prior to 20 weeks gestation) with 31 primiparae expectant couples at 8 months gestation, a time beyond the point when the previous pregnancy had ended. No significant differences were found between the groups on the BDI. Franche and Mikail (1999) examined the emotional adjustment of 31 pregnant women with a perinatal loss occurring in the prior pregnancy (55% reported that the loss had occurred within the first trimester; 22%, within the second trimester; and 10%, within the third trimester; and 13% reported a neonatal death) relative to 31 pregnant women without a history of such loss matched on gestational age at the time of assessment (i.e., between 10 and 24 weeks

gestation). Those with a history of reproductive loss reported significantly greater (albeit mild) scores on the BDI. Their depressive symptomatology was significantly associated with the number of previous reproductive losses as well as with self-criticism and interpersonal dependency as measured with the Depressive Experiences Questionnaire, whereas for the comparison group, BDI scores were associated with dyadic adjustment. Franche and Mikail (1999) concluded that a prior loss does not represent a risk factor for depressive symptomatology in a future pregnancy, but that mild depression more accurately indicates general distress.

Some researchers maintain that the risk for affective outcomes in the subsequent pregnancy can be impacted by time since reproductive loss. Hughes et al. (1999), who studied a cohort of 60 pregnant women whose previous pregnancy had ended in loss after 18 weeks gestation relative to a cohort of 60 matched control women without a history of such loss, found that women with a prior loss were at greater risk for depressive symptoms (measured with the BDI and the Edinburgh Postnatal Depression Scale) during the third trimester of the subsequent pregnancy and one year postpartum, but not in the early postpartum period. However, when time since loss was included in analyses, Hughes et al. (1999) found that women who conceived less than 1 year after loss accounted for the difference. Results for women who became pregnant more than 1 year following loss were similar to their controls at all time points assessed, prompting the advisement that women wait 12 months before attempting conception. Some prospective studies assessing depressive reactions post loss have concluded that miscarrying women who are least depressed after an extended follow-up period are those who are pregnant again or have given birth (Cuisinier et al., 1996; Garel et al., 1994; Swanson, 2000). As with grief, additional research addressing the degree to which a subsequent pregnancy and healthy birth can limit depressive reactions following miscarriage is warranted. Additional work also can help provide guidance to health care providers as to whether to encourage a new pregnancy subsequent to a miscarriage for women experiencing grief and depressive symptomatology, as well as the appropriate timing for this.

In conclusion, the debate continues as to whether clinicians should advise miscarrying women to try to conceive right away or to wait until they have resolved their grief and depressive symptoms before trying again. Recent studies conclude that while women may be justifiably distressed or anxious during a subsequent pregnancy about the prospect of yet another loss, a subsequent pregnancy does not necessarily lead to psychopathology and is in fact experienced as healing for many parents. Thus, clinicians are advised to discuss this issue with their patients and help them to come to their own decisions, particularly since a sense of choice and control is often a welcome relief in itself (Cuisinier et al., 1996; Franche and Bulow, 1999; Franche and Mikail, 1999). Furthermore, clinicians should watch for and intervene early if anxiety or depression does develop during the subsequent pregnancy, to prevent it from becoming more entrenched (Franche and Mikail, 1999).

9.2 Impact of miscarriage on male partners

Although men also can be deeply affected by reproductive loss, to date, there has been little rigorous research literature addressing the impact of miscarriage on the partners of miscarrying women. No published research exists regarding the female partner's response to the loss in the case of lesbian couples. As discussed below, there are major design limitations in the initial studies addressing the impact of miscarriage on the partners of the miscarrying women that limit clear interpretation of findings that exist. Despite the limitations, we present a brief overview of the literature that exists in this emerging area of interest but emphasize the great need for systematic work on this important topic.

One researcher provided a first-hand account where he described his feelings of loss and helplessness, and the lack of information he received from medical staff when his wife miscarried (Cumings, 1984). In a treatment trial by Forrest et al. (1982), only a small proportion of men participated, thus no detailed information about their experiences was reported. However, from the reports of the females it seemed that most men had coped with the loss in the first weeks by going back to work as soon as possible. A later qualitative study (Black, 1991) found very similar results concerning the differences between men and women in the experience of the loss and their use of coping strategies. During a pregnancy subsequent to miscarriage, some men struggle with an additional issue: the fear of losing their partner if the previous loss was a medical

emergency for her (O'Leary and Thorwick, 1997). Goldbach et al. (1991) also found gender differences in grief following pregnancy loss, supporting findings by Leppert and Pahlka (1984) that in early pregnancy loss, the male partner may have more difficulty relating to his wife's intense emotional grief. Incongruent grieving, which most often involves women grieving more than men, might be more of a problem in early loss (Peppers and Knapp, 1980). Goldbach et al. (1991) found that by one and two years after the loss, gender differences had dissipated with both parents displaying similar levels of overall grief, difficulty coping, and despair, whereas women expressed greater grief than men eight weeks after the loss.

Johnson and Puddifoot (1996) focused entirely on the grief response of the male partner following miscarriage. A sample of 126 men whose partners had an early, middle or late miscarriage was given a self-report grief scale to complete. Results showed that the mean of the grief scores of the men was similarly high to norms expected for women after experiencing miscarriage. Those men who saw the ultrasound scan had greater difficulty coping and demonstrated greater despair. Johnson and Puddifoot (1996) hypothesized that coping difficulties in these men might be related to the demands of being in the role of "comforter," compounded by feelings of inadequacy aroused by their inability to influence events, while insufficiently attending to their own emotional responses to the loss. Men also are likely to express their grief and distress somewhat differently than women, as studies have found men to cry less, want to talk about it less, and to express more anger (Beutel et al., 1996a; Johnson and Puddifoot, 1996). Beutel et al. (1996a) compared rates of depressive symptoms and bodily complaints (assessed by the CSRS) in 56 miscarrying women and their partners, with age-matched community samples of 56 men and 56 women. They found that 29% of the miscarrying women and 10% of their male partners had elevated depression scores within one week after the loss, as compared to 8% of the females and 7% of the males in the community sample. Six months later, the rates of depressive symptoms in miscarrying women and their partners no longer differed from the population controls. Unfortunately this interesting design is jeopardized by the small sample size.

In addition, Vance et al. (1995), who studied the gender differences in parental psychological distress following perinatal death or sudden infant death

syndrome, found that anxiety and depression in women are longer lasting. The male response involves short-term anxiety and depression, but also involves heavy alcohol consumption. As grief and depression in men may manifest differently than in women, future studies should evaluate the use of alcohol and aggressiveness when assessing male reactions. Recently, it has been postulated that some SIDS deaths actually may have been undiagnosed infanticides (Overpeck et al., 2002), which would clearly influence maternal reaction to the loss as well as the impact on the male partner.

Two strong caveats are needed when evaluating the above work from an epidemiological perspective. The differences noted in these studies between levels of distress in miscarrying women and their male partners may reflect gender differences in response to the loss. However, it is possible that any greater impact of the miscarriage on the woman reflects the fact that she carries the pregnancy, biologically as well as symbolically. Second, insofar as we are concerned specifically with a possible differential magnitude of the effect of miscarriage on male partners as compared with that on the miscarrying women, a comparison of the absolute level of distress between partners is uninformative. For example, since in general women have increased levels of depressive symptoms compared to men, we would expect that the level of depressive symptoms among women would exceed that of their male partners solely as a function of their difference in gender, even if their response to the loss were of equal strength. To assess whether miscarriage exerts a greater influence on depressive symptoms in the male partner of women who miscarry, the levels observed in these men and women must be compared with levels in an otherwise comparable group of men and women, respectively, who have not experienced a miscarriage. To date, with the exception of Beutel et al.'s (1996a) study, the studies that were undertaken in the field of partner's response, did not use a design that would satisfy this requirement (Black, 1991; Cumings, 1984; Forrest et al., 1982; Goldbach et al., 1991; Johnson and Puddifoot, 1996; O'Leary and Thorwick, 1997; Vance et al., 1995).

10. Treatment options for women affected by psychological sequelae after miscarriage

A recent commentary on the management of the emotional reactions to miscarriage states that

surveys of patient satisfaction following miscarriage still indicate a high percentage of anger and dissatisfaction with the medical care received (Brier, 1999). On the other hand, there are now numerous bereavement counseling programs designed to alleviate psychological distress following loss. These interventions are offered during the stay at the hospital, at the outpatient clinic and at home, with women sometimes contacted by telephone. This widespread use of supportive counseling and therapy programs for miscarrying women has not yet been evaluated for safety or efficacy and only a few uncontrolled studies are published (Geerinck-Vercammen, 1999; Jacobs et al., 2000; Leon, 1987; Leppert and Pahlka, 1984). In one uncontrolled study, Lee et al. (1996) investigated debriefing two weeks after miscarriage in 49 women. The intervention was perceived to be helpful but did not impact emotional adaptation as measured by the HADS.

There is a substantial lack of controlled randomized trials of counseling after perinatal loss and stillbirth. The first controlled study by Forrest et al. (1982) involved 50 women who had either a stillbirth or perinatal loss of at least 28 weeks gestation, and were randomly assigned to receive either routine hospital care or planned support and counseling. The planned support component involved such things as encouraging the woman to see, hold and name her dead baby and keep a photograph; giving the woman a choice to return to her own ward or the isolation unit; allowing ample time for contact with the medical staff, a social worker, a community midwife and a general practitioner; arranging follow-up care for obstetric counseling, genetic counseling (if necessary), and a pediatric consultation to discuss postmortem results. Bereavement counseling was also offered to both parents between 24 and 48 hours after the baby's death. The number of counseling sessions in this study varied from 1 to 8, but otherwise specific treatment modalities are not discussed. The treated women fared significantly better than those receiving routine hospital care, which varied widely and depended upon the attitudes of individual staff members and the parents' individual reactions to loss: only 13% were rated as "psychiatric cases" using the GHQ 6 months after the loss in comparison to 53% of women receiving standard care.

A randomized controlled trial of time-limited, telephone administered bereavement counseling following miscarriage is currently underway (Neugebauer et al., 2001). A standardized counseling protocol focused primarily on miscarriage/early fetal loss was developed, employing 1–6 sessions of telephone administered interpersonal counseling, and has commenced an evaluation of its safety, acceptability, and efficacy. Women symptomatic at baseline (BDI scores > 8) are allocated either to interpersonal counseling ($n = 80$) or standard care ($n = 80$). This study will assess the safety and preliminary evidence of efficacy of counseling to alleviate depressive reactions to loss among miscarrying women. Counseling for miscarriage has the potential to substantially reduce psychiatric morbidity among women of reproductive age, but more rigorous research in this field is needed.

Regarding psychological treatment for women with recurrent miscarriages, Gannon (1994) reviewed the literature on psychological factors in the etiology, as well as treatment, of recurrent miscarriage. Gannon states that there are flaws in the three studies that used a control group (i.e., Stray-Pedersen and Stray-Pedersen, 1984, 1988; Tupper and Weil, 1962), including problems with random assignment. In addition, no pure psychotherapy effect was measurable because of other interventions received by both groups. The low success rate of the untreated control groups resembles the spontaneous recovery rate. Regarding the etiology, there is evidence that psychological distress is more likely a consequence of recurrent spontaneous abortion than part of the etiology (Bergant et al., 1997; Lapple, 1989).

10.1 Interventions for pregnant women

Psychological intervention may help alleviate the symptoms experienced by women with perinatal loss who have become pregnant again. Carrera et al. (1998) analyzed BDI scores in 23 women who experienced a perinatal loss and received psychological intervention of a supportive nature for 1 year after loss (no information regarding timing of loss was provided) and 37 women who had a live birth following a full gestation period. No information regarding history of loss was provided for this comparison group. A third group of 34 women with perinatal loss 12 months prior who received no intervention also was assessed at the 12 month follow-up point. Immediately after delivery and 6 months postpartum, women with a prior loss and no intervention showed higher levels of depressive symptoms than the live birth group, although their BDI scores had decreased. After the psychological

intervention was administered for 1 year, the BDI scores in the perinatal loss group were similar to those in the live birth group, but those with a prior loss and no intervention displayed higher levels of depressive symptoms. Additional work is needed in this area.

11. Conclusion

Since 1992, a body of research investigating psychiatric and psychological distress and disorder following miscarriage has been conducted in a rigorous way using control groups of pregnant and/or community women. The results of these studies allow us to conclude the following: In the first six months after the loss event, women are at elevated risk for depressive symptoms, subthreshold depression and depressive disorders. Childlessness was found to be an effect modifier in most studies, whereas factors such as a personal psychiatric history, stress during pregnancy, dissatisfaction with social support and unplanned or unwanted pregnancy have not been established as effect modifiers (i.e., results were inconsistent across studies).

Whether the psychological distress of a miscarriage continues into the next pregnancy, or as some authors suggest, is resolved by a new pregnancy, is not yet known. Women who experience clinically significant depression and/or grief after a miscarriage should be followed until after the birth of the subsequent child. In addition, secure attachment between these mothers and their children born subsequent to loss should be of concern. Gynecological research provides no evidence to support a waiting period to avoid the risk of a recurrent miscarriage for couples that wish to conceive shortly after a miscarriage (Rud and Klunder, 1985; Vlaanderen, 1988; Wyss et al., 1994). From a psychological perspective, opinions are mixed. As a resolution, Davis et al. (1989) argues that women should be informed about the advantages and disadvantages of postponing pregnancy.

Very few studies have evaluated the psychological reactions of male partners, and those that do have been uncontrolled. These initial studies demonstrate that men are affected by the loss of a pregnancy even though their coping strategies for dealing with the loss may differ from those of women, including such maladaptive strategies as substance use and aggression. New technologies such as ultrasound also may impact males' "attachment" to the fetus. Male

partners' role as emotional support provider to the women might make it difficult for men to attend to their own needs. Proper control groups will have to be employed in future studies in order to get conclusive information about male partners' risk for affective disorders and symptoms following miscarriage. With increasing numbers of lesbian couples attempting pregnancy through alternative methods, such as artificial insemination, research examining the impact of miscarriage on female partners also is warranted.

A recent commentary on the management of the emotional reactions to miscarriage states that surveys of patient satisfaction following miscarriage still indicate a high percentage of anger and dissatisfaction with the medical care received even though supportive counseling and therapy programs for miscarrying women are increasingly available. There is a substantial lack of controlled studies in this field, and the two published studies have discordant findings. We know that there is a high risk for affective disorder following miscarriage, so women should be offered screening for psychiatric disorders or symptomatology, as well as treatment. In addition to affective disorders, screening and treatment options for substance use and anxiety also may be appropriate (Geller et al., 2002). Treatment for those women who are seriously affected by their miscarriage not only is important for the mothers themselves, but also may help them to develop secure attachments to children born subsequent to the loss so that unresolved grief and depression do not impair those relationships (Hughes et al., 2001).

Many very well designed studies have been performed in the last decade and all of them demonstrate the severe and enduring psychological consequences of miscarriage. Now this knowledge must be transferred and employed routinely in clinical settings, while screening and treatment options need to be studied in a rigorous way.

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