indicators.[14] In addition to correction for age and sex, these data were also corrected for social deprivation with the Carstairs index,[15] based on postcode sectors of residence according to the 1991 census. Data were also corrected for pre-existing morbidity, which was based on the principal Scottish Morbidity Record 1 (SMR1) diagnoses for the preceding five years, not on secondary diagnoses recorded at the time of discharge after stroke—that is, there was no correction for other conditions that had not been noted in previous hospital admissions. It was acknowledged that this system represented an extremely crude and only partial adjustment. Moreover, there was still no correction for crucially important case mix variables for stroke prognosis, such as level of consciousness on admission.

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Psychological complications after stillbirth—influence of memories and immediate management: population based study

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Abstract

***Objective*—To identify factors that may predict long term psychological complications among women who have had a stillborn child.**

***Design*—Nationwide population based study using epidemiological methods.**

***Subjects*—380 subjects and 379 controls who had had a stillborn or non-deformed live child in Sweden in 1991.**

***Results*—Information was provided by 636 (84%) women. The ratio (95% confidence interval) of proportions of women with symptoms related to anxiety above the 90th centile for women who had had a stillborn child compared with those who had not was 2.1(1.2 to 3.9). An interval of 25 hours or more from the diagnosis of death in utero to the start of delivery gave a ratio of 4.8 (1.5 to 15.9). The ratio was 2.3 (1.1 to 5.3) for not seeing the child as long as the mother had wished and 3.1 (1.6 to 6.0) for no possession of a token of remembrance.**

***Conclusion*—It is advisable to induce the delivery as soon as feasible after the diagnosis of death in utero. A calm environment for the woman to spend as much time as she wants with her stillborn child is beneficial, and tokens of remembrance should be collected.**

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Introduction

It is psychologically traumatic to give birth to a stillborn child. A stillbirth is often unexpected and happens quickly, and the emotional changes experienced by the parents are enormous. Investigations have reported that 20-30% of women with perinatal loss of a child have appreciable psychiatric long term morbidity.[1-6] The rapidly changing practice in maternal care during recent years may have altered the prerequisites for these mothers being able to cope with the trauma.[7-16] Twenty years ago a stillbirth was normally regarded as a "non-event."[17] Today, the approach is the reverse; it is believed that confronting parents with the reality facilitates healthy mourning.[18]

The new routines may have drawbacks. Bourne and Lewis argue that there now is a danger that staff may inflexibly apply the dogma, demanding that every woman should obediently inspect and hold her stillborn child.[19] Leon states that checklists and behavioural protocols may result in disturbing "institutionalisation of bereavement."[20] To be able to disentangle all the suggested actions and divergent kinds of advice, data are needed.

Methods

We identified all mothers who had had a stillborn child in Sweden in 1991 (subjects) through the medical birth register of the National Board of Health and Welfare. In 1991, 124 201 children were born in Sweden, of whom 464 (3.7 per 1000) were stillborn (defined as a fetus at ≥28 weeks' gestation). Each control had delivered a live child with no deformities at the same hospital as a subject on a date as close as possible to the birth date of the corresponding subject's stillborn child. Overall, 380 subjects and 379 controls fulfilled the criteria of having given birth to a single child (stillborn or alive) and being fluent enough in Swedish to answer a questionnaire. We collected data by a postal questionnaire and safeguarded the anonymity of the investigation by letting the women return the questionnaire separately from a second form, in which they confirmed that they had replied. We collected the information during October 1994.

We assessed anxiety related and depression related symptoms using the trait anxiety inventory[21] and the Center for Epidemiological Studies depression scale.[22] We summarised the responses to the questionnaire by giving a score on a scale of 1-4 (1=least severe symptoms, 4=most severe symptoms) for each answer and dividing the sum of these scores by the number of questions answered.

In the analysis we formed dichotomised variables. For the summary average score on the trait anxiety

Table 1—*Proportion (percentage) of women with anxiety related symptoms above 90th centile and ratio of proportions (95% confidence interval) between women exposed to variable and women unexposed to variable, according to details of delivery and aspects of image of stillborn child*

Variable	Proportion with anxiety	Ratio of proportions
Details of the delivery		
Time from diagnosis of death in utero to start of delivery (hours)*:		
<6	5/83 (6)	1.3 (0.3 to 5.1)
6-24	8/97 (8)	1.7 (0.5 to 6.3)
≥25	15/65 (23)	4.8 (1.5 to 15.9)
Stillborn child was delivered by caesarean section	3/33 (9)	0.9 (0.3 to 2.8)
Basis for abstract memory		
Not having seen child	2/13 (15)	1.6 (0.4 to 6.0)
Having been with child <10 min†	4/33 (12)	1.7 (0.6 to 5.2)
Having been with child ≥10 min but <1 hour†	12/103 (12)	1.6 (0.7 to 3.7)
Not seeing child for as long as had wished	8/43 (19)	2.4 (1.1 to 5.3)
Not having touched child	5/47 (11)	1.1 (0.4 to 2.6)
Tokens of remembrance related to child		
Possessing no token of remembrance (statement)	14/64 (22)	3.1 (1.6 to 6.0)
Possessing tokens of remembrance‡:		
No tokens	9/54 (17)	4.0 (1.4 to 11.3)
One token only	17/135 (13)	3.0 (1.1 to 7.9)

*Reference category: women who reported that they did not know child was dead when delivery started.
†Reference category: women who reported that they saw child for one hour or more. Those who did not see their child at all were excluded from analysis.
‡Collapsed variable, where possession of satisfactory photograph of child, ultrasound scan of child, lock of hair from child, or handprint or footprint from child were each counted as possession of one token.

inventory and the depression scale we used a previously chosen cut off point at the 90th centile among the subjects, and we studied the proportion of subjects above this. As an effect measure, we worked out a ratio of proportions between subjects and controls and between subgroups of subjects. The ratio was above 1.0 when the exposure increased the proportion of subjects with severe symptoms. Data were processed with SAS, and the regression models were formed in the Genmod Procedure with a binomial or logistic link.[23] The procedure yields 95% confidence limits for the unadjusted or adjusted ratio of proportions based on a likelihood function. Fisher's exact tests were used to compare groups, and we report two sided P values.

Results

Information was provided by 636 women (response rate 83% (314/380) for the subjects, 85% (322/379) for the controls). The mean age was the same in both groups, 32 years in 1994. The marital status was similar, while the educational level was lower among the subjects. Figure 1 shows the distribution of the trait anxiety inventory scores. Among the subjects the mean was 1.82 and the median 1.65, with the 10th centile at 1.25 and 90th at 2.55. Among the controls the mean on the trait anxiety inventory was 1.74, the median 1.65, and the 10th and 90th centiles 1.30 and 2.25 respectively. By definition, 10% (31/308) of the subjects had a value above 2.55. The proportion of controls with a value above 2.55 was 5% (15/318), giving a ratio of proportions of 2.1 (95% confidence interval 1.2 to 3.9; P=0.01). Findings were similar for depression related symptoms, but the difference between groups was less accentuated.

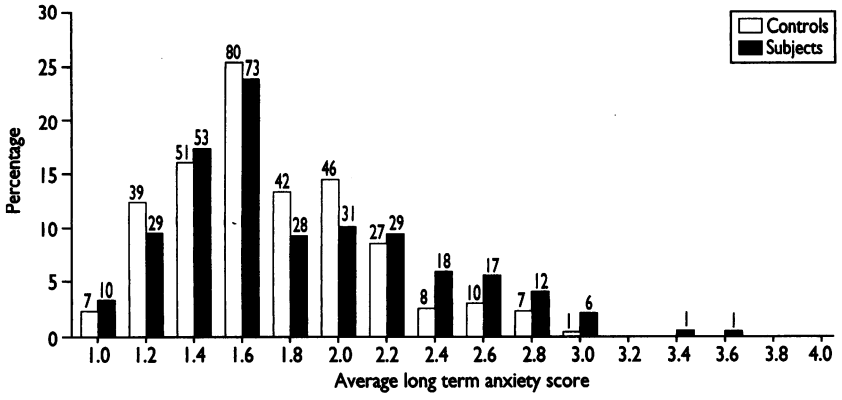

Fig 1—*Distribution of average long term anxiety scores. Information was obtained from 308 subjects and 318 controls*

Table 1 shows the ratio of proportions of subjects with anxiety related symptoms above 2.55, according to details of the delivery and the woman's image of her stillborn child. With regard to the time from diagnosis of death in utero to the start of delivery, a tendency towards a dose response relation was seen, and for a delay of 25 hours or more a strong association was observed. Nearly a quarter (23%) of the women with such a delay had anxiety related symptoms above the 90th centile, compared with 5% (3/63) among the women without this delay (ratio of proportions 23%/5% =4.8 (P=0.004)).

More women who reported that they did not see the child for as long as they had wished had anxiety related symptoms above the 90th centile than did the women who did not report this (19%/8% =2.4 (P=0.04)). A ratio of proportions near unity was found for women who had not touched (held, caressed, kissed, or dressed) the child.

A strong association with anxiety related symptoms (P=0.002) was found for women reporting, "I have no token of remembrance at all from my child." The proportion of women with a high level of anxiety was 7% among those who had some sort of token of remembrance and 22% among those who had no token. The ratio of proportions was even higher when a collapsed variable indicated the entity.

In one regression model of two variables, both seeing the child as long as the woman wished and reporting that she possessed no token of remembrance contributed significant information (P=0.03 and P=0.01 respectively). In another model, time from diagnosis of death in utero to start of delivery and a subsequent pregnancy both contributed significant information (P=0.02 and P=0.001 respectively). The model did not converge when all four of the above mentioned variables were introduced together. A logistic regression model was done, in which seeing the child as long as the woman wished, reporting that she possessed no token of remembrance, and time from diagnosis of death in utero to start of delivery each contributed significant information (P=0.01), while absence of a subsequent

pregnancy did not (P=0.3). Table 2 shows changes in estimate after adjustment for potential confounding factors.

Some variables gave significant associations for depression related symptoms above the 90th centile. Not seeing the child as long as the woman wished gave a ratio of proportions of 5.4 (2.7 to 11.2) (P<0.0001). Twenty nine per cent of the women who reported this had a score on the depression scale above the 90th centile. Just as for anxiety, the ratio increased after adjustment for background factors.

Discussion

In this follow up of 636 women, risk of anxiety related symptoms above the 90th centile doubled among those who had had a stillborn child compared with those whose child was born alive. The findings warrant a search for predictors of anxiety related symptoms among the women who had a stillborn child, but the difference between the groups was modest.

Our results seem to contradict the high figures for psychological morbidity previously reported.[1-6] Reviewers have criticised earlier studies for their lack of standardised ways of measuring outcome, lack of a control group, and low precision due to small numbers.[24 25] Because of the dissimilarity of methods in assessing outcome, published cohorts cannot be cited as a reference for our results. Previous data may be invalid, but a high prevalence of psychological morbidity is conceivable among women who were not taken care of in the same way as they are today after stillbirths.

We noted a strong association between waiting more than 24 hours before the start of delivery after the diagnosis of death in utero and anxiety related symptoms. Thus, postponing the delivery for such a long time may induce an unnecessary psychological experience that is difficult to cope with. Psychological reasons are sometimes given for postponing the delivery, but our findings contradict such arguments. The optimal interval from diagnosis in utero to induction of delivery remains uncertain, but more than 24 hours is typically too long.

Not seeing the child for as long as the woman wishes and a lack of concrete tokens of remembrance increased the risk of anxiety or depression related symptoms. The associations obtained were strong. Mutual confounding and confounding by measured background factors could not explain the findings. Minimising the occurrence of these factors needs a lot of skill on the part of the midwife and the physician in charge. On the surface the woman is in shock, possibly crying, but she may also have feelings of pride in her child. It is a meeting and parting at the same time, and our results suggest that the meeting and parting is important and should be strengthened to diminish the risk of long term psychological complications.

Key messages

- Confronting mothers of stillborn babies with the reality of the death has been thought to facilitate healthy mourning
- This study used an anonymous postal questionnaire to 636 women to assess mothers' needs
- It shows that it is advisable to induce the delivery as soon as feasible after the diagnosis of death in utero
- A calm environment, with the mother able to spend as much time as she wants with her dead newborn child, is beneficial, as are tokens of remembrance of the child
- Rather than enforcing mourning rituals, flexibility should be shown towards the mother's own needs

Our study supports the notion that, while creating a tranquil atmosphere around the newborn child directly after delivery, the staff should not force the mother to hold, caress, or kiss the dead child. Such actions were not beneficial in terms of a reduced risk for anxiety or depression. Mothers wanting to engage in activities other than just being with the child may be encouraged to do so, but women wanting to abstain should probably be allowed to. Also, our data show that it is difficult to set a time limit defining how long the meeting should last before the mother parts with her stillborn child.

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Table 2—*Ratio of proportions for anxiety related symptoms above 90th centile between women exposed to variable and women unexposed to variable, unadjusted and adjusted for age, level of education, being single, being unemployed, and no subsequent pregnancy**

Variable	Unadjusted	Adjusted for: Age	Education	Single	Unemployed	No later pregnancy
Time from diagnosis of death in utero to start of delivery ≥25 hours†	4.8	4.8	4.8	Model did not converge	4.4	4.3
Not seeing child for as long as wished	2.4	2.9	2.8	2.5	2.5	2.7
Possessing no token of remembrance (statement)	3.1	3.1	2.8	2.8	3.1	2.7
No of tokens of remembrance‡:						
Possessing no tokens	4.0	4.0	3.9	4.0	3.7	3.6
Possessing one token only	3.0	3.0	3.0	3.0	2.8	3.1

*Ratio of proportions are obtained from regression models where exposure and respective factors are introduced in pairs.
†Reference category: women who reported that they did not know child was dead when delivery started.
‡Collapsed variable, where possession of satisfactory photograph of child, ultrasound scan of child, lock of hair from child, or handprint or footprint from child were each counted as possession of one token.

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Does suppressing luteinising hormone secretion reduce the miscarriage rate? Results of a randomised controlled trial

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Abstract

***Objective*—To determine whether prepregnancy pituitary suppression of luteinising hormone secretion with a luteinising hormone releasing hormone analogue improves the outcome of pregnancy in ovulatory women with a history of recurrent miscarriage, polycystic ovaries, and hypersecretion of luteinising hormone.**

***Design*—Randomised controlled trial.**

***Setting*—Specialist recurrent miscarriage clinic.**

***Subjects*—106 women with a history of three or more consecutive first trimester miscarriages, polycystic ovaries, and hypersecretion of luteinising hormone.**

***Interventions*—Women were randomised before conception to receive pituitary suppression with a luteinising hormone releasing hormone analogue followed by low dose ovulation induction and luteal phase progesterone (group 1) or were allowed to ovulate spontaneously and then given luteal phase progesterone alone or luteal phase placebo alone (group 2). No drugs were prescribed in pregnancy.**

***Main outcome measures*—Conception and live birth rates over six cycles.**

***Results*—Conception rates in the pituitary suppression and luteal phase support groups were 80% (40/50 women) and 82% (46/56) respectively (NS). Live birth rates were 65% (26/40) and 76% (35/46) respectively (NS). In the luteal phase support group there was no difference in the outcome of pregnancy between women given progesterone and those given placebo pessaries. Live birth rates from an intention to treat analysis were 52% (26/50 pregnancies) in the group given pituitary suppression and 63% (35/56) in the controls (NS).**

***Conclusions*—Prepregnancy suppression of high luteinising hormone concentrations in ovulatory women with recurrent miscarriage and hypersecretion of luteinising hormone does not improve the outcome of pregnancy. The outcome of pregnancy without pituitary suppression is excellent.**

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Introduction

Hypersecretion of luteinising hormone is strongly associated with subfertility and early pregnancy failure. Studies from assisted conception cycles have shown an adverse effect of high luteinising hormone concentrations on fertility[1-3] and early pregnancy outcome.[4 5] A similar effect has been reported in spontaneous, unstimulated cycles.[6 7] Women with a history of recurrent early miscarriage have a high prevalence of polycystic ovaries,[8 9] and many of these women hypersecrete luteinising hormone.[10 11]

Endogenous luteinising hormone secretion can be suppressed with agonist analogues of luteinising hormone releasing hormone. Luteinising hormone releasing hormone analogues are used routinely in in-vitro fertilisation treatment protocols with a reported decrease in the number of cancelled cycles, improved pregnancy rates,[12-14] and a reduction in the number of early miscarriages[15-18] when compared with conventional superovulation techniques. Prepregnancy treatment with luteinising hormone releasing hormone analogues may improve the outcome of pregnancy in women with recurrent miscarriage who hypersecrete luteinising hormone. We evaluated this hypothesis in a randomised controlled trial.

Patients and methods

TRIAL DESIGN

The trial was designed to determine whether pituitary suppression of high endogenous luteinising hormone concentrations followed by low dose ovulation induction and luteal phase progesterone support improves the outcome of pregnancy in ovulatory women with recurrent miscarriage, polycystic ovaries, and hypersecretion of luteinising hormone. To exclude any possible benefit of luteal phase progesterone support the control groups comprised two groups of women who ovulated spontaneously receiving either luteal phase progesterone alone or luteal phase placebo. Women were randomised to receive pituitary suppression (group 1) or luteal phase support alone (group 2) by means of a computer generated random number list (Systat 5,2.1; Macintosh). Women allocated to receive luteal phase support were further randomised by numbered opaque sealed envelopes to receive either luteal phase progesterone (subgroup 2a) or luteal phase placebo (subgroup 2b). Randomisation to groups 1 and 2 could not be blinded as the clinical effects of pituitary suppression could not be concealed from either the subject or the observer. Allocation to subgroups 2a and 2b was double blind. The main outcome measures were conception and live birth rates over six cycles.

ENTRY CRITERIA

All couples attending the recurrent miscarriage clinic were investigated according to our protocol.[11] The trial began in 1992 and women were considered eligible if they