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Original contribution

A Screening Questionnaire for mother-infant bonding disorders

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Summary

Background: There is a need in primary care for an easily administered instrument to give early indications of disorders in mother-infant relationships.

Methods: An 84 item questionnaire was administered to 104 subjects, including normal mothers, depressed mothers with a normal mother-infant relationship and mothers with bonding disorders. A principle component analysis was used to select items for scale construction. Scale scores were compared with interview data. Reliability, sensitivity and specificity of the scales were measured.

Findings: 4 factors of clinical relevance were obtained and used to construct 4 scales. The questionnaire was reduced to 25 questions. Scale 1 (impaired bonding) had a sensitivity of 0.93 in detecting mothers with bonding disorder. Scale 2 (rejection and anger) specifically identified mothers with severe disorders. Scale 3 may be useful in anxious mothers. Scale 4 signalled the presence of incipient abuse, requiring urgent intervention.

Interpretation: This questionnaire can be used, with the Edinburgh Postnatal Depression Scale, by midwives and health visitors, for the early diagnosis of mother-infant bonding disorders.

Keywords: Bonding disorders; postpartum depression; Self Rating Questionnaires; child abuse.

Introduction

Screening instruments are useful in primary care to alert the medical services to potential clinical problems. In the field of puerperal mental disorders, there is already a widely used instrument – the 10-item Edinburgh Postnatal Depression Scale (Cox et al., 1987) – which detects a variety of disorders under the rubric of "postnatal depression". Although most depressed mothers enjoy a normal relationship with their infant, a substantial minority suffer from a failure of maternal emotional response. This may cause or complicate depression, and has potentially serious effects on the long term mother-child relationship, and on child development. It occasionally leads to child abuse or neglect (Brockington, 1996).

It would be useful for obstetric and primary care teams to have a screening instrument specifically targeted at disorders of the early mother-infant relationship. Teams at the University of Birmingham and the Open University were concurrently developing screening instruments, and decided to combine their efforts. This resulted in the Postpartum Bonding Questionnaire, which is described here.

Participants and methods

The Birmingham team developed a 40 item Questionnaire, based on their work with patients referred to a pregnancy-related sub-regional service. The questions started with a mother-centred stem ("I feel . . ."). The Open University team developed a 44 item Questionnaire in work with mothers in the general population. The items asked mothers to attribute characteristics to their infants ("My baby is . . ."). The two instruments were combined, and administered as a single unit. Responses to each item were given on a 6-point Likert scale, with the scale points labelled "always", "very often", "quite often", "sometimes", "rarely" and "never".

Over a 2 year period, 104 subjects were recruited from a variety of sources

– 33 mothers from the normal population (recruited from general practice or obstetric clinics)

- 22 mothers of babies with foetal abnormalities, at high risk of the same or identified as high risk pregnancies due to obstetric complications or previous obstetric history
- 21 depressed mothers with a normal mother infant relationship
- 28 depressed mothers with various degrees of impaired mother-infant bonding (of whom 2 had twins, with a normal response to one, and an impaired response to the other)

25 mothers with an impaired relationship with their babies were followed through a period of treatment, and an additional 114 questionnaires completed. Of these 88 were completed by mothers in the course of treatment, and 26 after apparent recovery. Thus, a total of 218 questionnaires were available for analysis.

51 mothers out of the original 104 mothers attending the clinic were interviewed, using the 3rd edition of the Structured Interview for Pregnancy-related Disorders (now called the Birmingham Interview for Maternal Mental Health), which is described in Chapter 11 of *Motherhood and Mental Health* (Brockington, 1996). This interview takes about $1^1/_2$ hours to administer and systematically covers the events of pregnancy, delivery and the puerperium. It includes a 24-probe section devoted to the mother-infant relationship (Appendix 1).

These patients were assigned to diagnostic groups by IFB and PV, who studied the interview data independently, applying the definitions shown in Appendix 2. IFB and PV gave independent ratings, and met to discuss and resolve disagreements, resulting in consensus diagnoses.

A principal component analysis of the 84 item combined questionnaire was undertaken, using Varimax rotation and an orthogonal solution. As explained below, this was used to select 25 items, which were representative of the 4 main factors relevant to disorders of the mother-infant relationship. Scores were calculated on 4 scales measuring these factors, with items indicating a favourable infant relationship scored in the opposite direction from those signalling pathology. Thus high scores indicate more pathological responses. The ranges and means of these scores were calculated for each diagnostic group. Sensitivity and specificity were calculated for the identification of all bonding disorders and the subgroup with severe disorders.

Short-term test-retest reliability was studied in an additional series of 30 mothers consecutively admitted to the in-patient unit, or attending the out-patient clinic. Two versions of the questionnaire were administered, with the questions in a different order, at an interval of about one hour.

Results

Principal component analysis

Factor 1 explained 34% of the variance. The following items had their highest loadings on this factor:

+0.82 I feel happy when my baby smiles or laughs
−0.82 The baby does not seem to be mine
−0.80 I wish my baby would somehow go away
−0.80 My baby winds me up

This factor appeared to be a general, bipolar factor concerned with *impaired bonding*. When constructing a scale to represent this factor, we decided to include items with a loading of >0.75 (except for one – "My baby disappoints me", which was endorsed by a relatively low percentage of mothers with bonding disorders). We also included some items with rather lower loadings in order to redress the balance between positive and negative items. They were "My baby is the most beautiful baby in the world" (+0.74), "I love my baby to bits" (+0.71), and "I feel close to my baby" (+0.70). 12/25 selected items represent this first factor, and were used in Scale 1.

Factor 2 explained 8% of the variance. The following items had their highest loadings on this factor:

0.53 I feel angry with my baby
0.52 My baby annoys me
0.51 I feel the only solution is for someone else to look after my baby
0.49 I feel distant from my baby

This factor appeared to be primarily associated with *rejection and anger*. For the second scale, we decided to include all those items with a loading of at least 0.48, and added one variable – I love to cuddle my baby (−0.42) – to improve the positive/negative balance. Thus 7 items were included to represent this factor, and were used in Scale 2.

Factor 3 explained 6% of the variance. It was entirely composed of items from the Open University set, for example "My baby likes to please me" (+0.55), "My baby is inquisitive" (+0.51) and "My baby cares about my feelings" (+0.49). This scale, which seemed to reflect perceptions of positive regard from the infant, has not been included because it seemed less relevant to the clinical study of bond-

ing disorders. It will be discussed elsewhere by one of us (JO).

Factor 4 explained 3.7% of the variance. The items with the highest loadings were all concerned with confidence – "I feel confident when changing my baby" (+0.57), "I feel confident when bathing my baby" (+0.51), "I feel confident when feeding my baby" (+0.44). It seemed best to merge these three items, to include "My baby is easily comforted" (+0.45), and add two others – "I am afraid of my baby" and "My baby makes me feel anxious". These 4 items were used to construct an artificial scale (Scale 3) concerned with *anxiety about care* of the baby.

Factor 5 explained 3.4% of the variance. Its highest loadings were for two items – "I have done harmful things to my baby" (−0.59) and "I feel like hurting my baby" (−0.57). These were included to signal the *risk of abuse* (Scale 4).

Each of the other factors accounted for under 3.4% of the variance.

Thus, we selected 4 factors accounting in total for more than 50% of the variance. These 4 factors were the basis for reducing the 84 items to a more easily administered 25-item screening instrument, with 4 scales.

Diagnoses

The consensus diagnoses are shown in Table 1.

Because of small numbers, it seemed appropriate to merge the last 3 groups into one group of severe disorders with rejection and/or pathological anger.

Range and mean scale scores in the groups

These are shown in Table 2. The results show that normal mothers, and depressed mothers with no evidence of impaired bonding at interview, were both well below the cut-off point on all scales.

Mothers with a mild bonding disorder, i.e. a delayed emotional response, ambivalence or secondary loss of bond, had a mean scale score well above the cut-off point on Scale 1, and well below on Scale 2. The combination of these two factors was, therefore, useful to identify this group.

Mothers with severe bonding disorders were above the cut-off point on all Scales except Scale 4.

Table 1. *Subjects and patients*

Diagnosis	Number of mothers	Notes
Postpartum depression with normal mother-infant relationship	19 + two twins	
Mild impairment of the mother-infant relationship	10 + one twin	4 with delayed maternal response, and one each with ambivalence, delay + ambivalence, delay + anxiety, ambivalence + anxiety, loss of bond + ambivalence, loss of bond + obsessions and ambivalence *or* loss of bond
Rejection alone	5	
Anger alone	5	2 with delayed maternal response + anger, 2 with delay, ambivalence + anger, one with loss of bond and anger
Rejection and anger	9 + one twin	

Table 2. *Mean scores*

Groups	Scale			
	1	2	3	4
Range of scores	0–59	0–34	0–20	0–10
Normal mothers	6.1 ± 5.2	3.1 ± 2.9	3.1 ± 2.3	Zero
Depressed mothers with normal bond	8.7 ± 9.2	5.1 ± 5.6	4.4 ± 3.4	0.24 ± 0.54
Cut-off point	11 = normal 12 = high	16 = normal 17 = high	9 = normal 10 = high	2 = normal 3 = high
Mild bonding disorders	19.9 ± 10.5	11.8 ± 3.5	6.6 ± 4.3	Zero
Severe bonding disorders	41.3 ± 12.2	24.8 ± 8.4	10.2 ± 4.8	1.78 ± 2.1

Appendix 1. Probes from the section of the Birmingham Interview for Maternal Mental Health (3rd edn.) dealing with the mother-infant relationship

Infant characteristics

Please tell me what your baby is like
Where you at all disappointed in his/her appearance, sex, or anything else about him/her?
Is there any other problem (not sleeping at night, crying too much, vomiting, not responding to you)?
Record mother's account of her baby and its temperament.

Mother's emotional response to her infant

How did your feelings for (name of baby) develop after delivery?
When did you first experience positive feelings and love towards him/her?
When did he/she first become a person to you?
When did he/she seem to recognise you as his/her mother?
What do you and your baby do together (cuddling, talking, playing)?
Have you felt disappointed with your feelings for (name of baby)?
How do you feel when you are away from (name of baby)?
How do you feel when your baby cries?
How do you feel when your baby wakes you at night?
Have you had any worrying thoughts about your baby, or impulses to harm him/her?
Record mother's statements about her emotional reaction to the baby.

(*If* there is evidence of an abnormal emotional reaction to her baby)

What do you really feel about your baby?
Have you felt trapped as a mother?
Have you felt like running away?
Have you ever felt that it would be better is someone else looked after him/her?
Have you considered adoption or fostering?
Did you ever wish that something would happen to him/her?
(Note particularly wish for cot death, or that baby is stolen).

Record mother's further account of her emotional response to her infant, and any evidence of rejection.

(*If the mother has experienced aggressive impulses to her infant* establish whether these are obsessional in form; and ask)

Does your baby make you feel very angry?
Have you ever lost control when you felt angry with him/her?
What did you do (shouting, screaming or swearing at the baby; rough treatment including jerking or throwing into cot; shaking, striking, smothering)?
What was the worst thing you did?
What was the worst thing you had an impulse to do?
In your efforts to get help and support, did you ever pretend that your child was ill?
Did you ever feel tempted to make him/her ill?
Record mother's statements about hostility to the child, or abuse, noting the nature and frequency of any abusive incidents.

Appendix 2. Definition of bonding disorders

Delay in, or loss of maternal emotional response

A to D are necessary

A *Either* The mother expresses disappointment about her feelings about her infant, eg that she has no feelings

Or She feels estranged or distant from it, eg. feels that this is not her baby, or that she is "baby-sitting" for someone else

B The definitions of rejection or pathological anger are NOT met

C The disorder may be evident during early puerperium, or may develop later in the context of depression, and has lasted at least one week

D These feelings are distressing and have resulted in an appeal for help, from family or professional staff

Pathological anger towards infant

A, and B *or* C are necessary

A The mother has experienced anger towards the child, in one of the forms listed below

B If it is experienced in the following milder forms, it is recurrent – has occurred at least twice

- Anger is experienced inwardly but controlled with difficulty
- She has an impulse to harm or kill the child (NOT in an obsessional form)
- There has been loss of control at the *verbal* level – she has shouted, screamed or sworn at him

C There has been one or more of these assaults on the child

- She has handled the child roughly, eg. throwing it into the cot, or jerking his limbs
- She has shaken him
- She has occluded his breathing
- She has struck, beaten, bitten, burned or thrown him
- She has made a deliberate attempt to kill him

Rejection of infant

A to D are necessary

A The mother expresses strong negative feelings about the child – dislike, hatred, regrets about its birth

B At least 2 of the following are present:

- There is an absence of affectionate behaviour – kissing, cuddling, cooing, motherese, singing, playing
- She feels better when away from the infant
- She expresses the feeling of being trapped by motherhood
- She has expressed a wish that infant care is transferred to someone else
- She has expressed the intention of a permanent transfer of care, eg adoption
- She has a conscious wish that infant is stolen
- She has a conscious wish that infant dies
- On at least one occasion she has run away to escape care of infant

C These feelings have lasted at least one week

D They are distressing and have resulted in an appeal for help, from family or professional staff

Appendix 3

THE POSTPARTUM BONDING INSTRUMENT
Please indicate how often the following are true for you.
There are no "right" or "wrong" answers:
Choose the answer which seems right in your recent experience.

NAME:

DATE:

	Always	Very often	Quite often	Sometimes	Rarely	Never
I feel close to my baby						
I wish the old days when I had no baby would come back						
I feel distant from my baby						
I love to cuddle my baby						
I regret having this baby						
The baby does not seem to be mine						
My baby winds me up						
My baby irritates me						
I feel happy when my baby smiles or laughs						
I love my baby to bits						
I enjoy playing with my baby						
My baby cries too much						
I feel trapped as a mother						
I feel angry with my baby						
I resent my baby						
My baby is the most beautiful baby in the world						
I wish my baby would somehow go away						
I have done harmful things to my baby						
My baby makes me anxious						
I am afraid of my baby						
My baby annoys me						
I feel confident when changing my baby						
I feel the only solution is for someone else to look after my baby						
I feel like hurting my baby						
My baby is easily comforted						

Table 3. *Sensitivity and specificity*

Scale	Cut-off point	Specificity (i.e. normal mothers plus depressed mothers with normal bond correctly identified as *not* suffering from a bonding disorder)	Sensitivity (i.e. mothers with *any form of bonding disorder* correctly identified)	Sensitivity (i.e. mothers with *severe bonding disorders* correctly identified)
1	11	46/55 = 0.85	26/28 = 0.93	All 18
2	16	All 55	16/28 = 0.57 (all 10 with mild bonding disorders were below threshold)	16/18 = 0.89
3	9	52/55 = 0.96	12/28 = 0.43	10/18 = 0.56
4	2	All 54	5/28 = 0.18	5/18 = 0.28

Sensitivity and specificity

The results are shown in Table 3. Scale 1 identifies over 90% of mothers with some form of bonding disorder, differentiating them from normal mothers and depressed mothers with a normal bond. Scale 2 identifies almost all those with severe disorders, differentiating them from all other groups, including mothers with mild bonding disorders. Scale 3 (concerned with anxiety) often showed abnormal scores in severe disorders, but was not sensitive enough to be useful in screening; this scale may be useful in identifying post-partum anxiety disorders, which were infrequent in the sample of patients studied. The 2 questions in Scale 4, concerned with abuse, were abnormal in only 36 schedules (17%). Of these 13 had a score of 1, and 13 a score of 2, which are below the cut-off point. Only 10 were above the threshold, of whom 5 suffered from severe disorders and 5 were still under treatment. This Scale, therefore, is useful as a warning sign of impending abuse, and the need for urgent assessment and intervention.

Reliability

Pearson's product moment correlation coefficients for the scale scores between the first and second administration of the instrument were 0.95, 0.95, 0.93 and 0.77 for the four scales. The time interval between the two assessments was short, but we feared that day-to-day variation would complicate the measurements if we had used a longer interval. These inter-rater reliability coefficients are satisfactory, except for Scale 4. Only 6 mothers, in the group used for reliability measurement, had scores suggesting incipient abuse. It may be that mother's reluctance to disclose aggressive impulses affects the consistency of their replies.

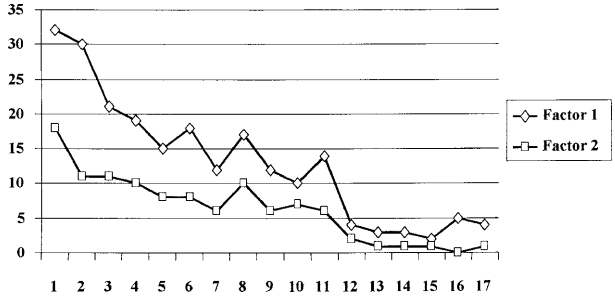

Fig. 1. A patient followed for 17 weeks

Serial measurements in mothers under treatment

Figure 1 shows the scores on 2 scales, in a patient followed for 17 weeks. At the start this mother was above threshold on both scales. Her score had already fallen below threshold on Scale 2 in the second week. It fell below threshold on Scale 1 in the 10th week, temporarily relapsing in the eleventh. Between weeks 12 and 17 the questionnaire documented her return to normal.

Discussion

The most important characteristic of a screening instrument is sensitivity. Since our results are optimised for the sample studied, it will be necessary to test sensitivity and specificity in an independent population. The figures are, however, encouraging. It

is satisfactory that Scale 2 seems to discriminate between mild and severe disorders.

The four questions concerned with anxiety (Scale 3) discriminated less well. This is not surprising because anxiety is not a major component of the bonding disorders commonly seen. Most of the mothers presenting to mother and baby psychiatric services have an absent or hostile, rather than anxious, maternal emotional response. Less commonly we see mothers whose maternal response is disturbed by anxiety, obsessional impulses and phobic avoidance. It is possible that Scale 3 will prove useful in detecting this group, but its validity will have to be tested in a sample which has a higher proportion of these patients.

As for Scale 4, concerned with incipient abuse, it is unlikely that a self-rating instrument can ever be adequate to explore these very sensitive matters. Nevertheless it seems that this schedule could help to detect at least a proportion of these mothers at high risk of abusing their infants.

Experience with patients in treatment shows that the instrument, administered weekly, can be a guide to progress. No claims are made that a self-rating instrument, or any other method based on the mother's subjective account, can reliably measure the mother-infant relationship. In research, and clinical assessment, the gold standard is direct observation. This inexpensive and easily administered tool, however, can make a contribution to the measurement of change.

This questionnaire can be used, with the Edinburgh Postnatal Depression Scale, by midwives and health visitors, for the early diagnosis of mother-infant bonding disorders.

References

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Availability

Copies of the PBQ, a scoring key and instructions for use are available from IFB or JO.

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