Screening for antenatal and postnatal depressive symptoms in general practice using a microcomputer-delivered questionnaire

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SUMMARY. One-hundred and eight women participated in a study which screened for depressive symptoms in the antenatal period. Of these women, 92 completed at least two further screenings during the postnatal year. The screening tool was the Hamilton Depression Rating Scale, adapted for self-rating, and administered by a microcomputer. It was found that mean scores and the prevalence of depressive symptoms rose throughout pregnancy, with a sharp peak in the third trimester. Following delivery there was an abrupt fall in the prevalence of depressive symptoms, followed by another rise, with a postnatal peak at six months.

There were significant associations, at all levels of severity, between raised scores antenatally, and those developing postnatally in women completing the study. These were more marked in multiparae than primiparae. There was also a significant association between a past history of treated depression and the development of raised postnatal scores for depression.

The routine use of a microcomputer to administer questionnaires to patients has proved feasible within general practice.

Introduction

DESPITE the increase in interest in postnatal psychiatric illness in recent years, relatively little has been reported on the identification, prevalence and treatment of postnatal depression in general practice.

In early studies, Tod found a prevalence of only 3% for depression in the postnatal year,[1] and Ryles showed a rate of 2.6% for 'depression with endogenous features'.[2] Playfair and Gowers found that 24.3% of their population had three or more depressive symptoms at three months postnatally.[3] In the psychiatric field, Pitt found a prevalence of postnatal depression of approximately 10%.[4] However, the important work of Kumar and Robson on primigravidae[5] reported a cumulative prevalence of 24% for depressive neurosis in the postnatal year, with a peak incidence of depression of 14% at three months.

It was decided to carry out a prospective survey of depressive symptomatology on a cohort of women followed through pregnancy and the postnatal year. Screening the women in routine surgeries posed logistic problems, and extra staff were not available to administer exhaustive interviews. It was therefore decided to make use of the innovative work which had been carried out in the administration of psychiatric questionnaires by microcomputer.[6] Recent work has shown that the Hamilton Depression Rating Scale, modified for self-rating on a computer, is highly correlated with the results of the scale obtained conventionally by a skilled observer[7,8] and with the standard Wakefield pencil and paper self-rating scale,[9] and correlates well with diagnosis by a clinician.[6] This tool had been used previously in the study practice and took between three and five minutes to complete. Evaluation of the use of this questionnaire as a screening tool in everyday clinical practice was a subsidiary aim of this study.

Methods

Patients

All those women attending a medical centre for antenatal care shared with a hospital (comprising 99% of all pregnancies) during the year 1982 were invited to participate in a screening study for postnatal depression, and the procedure was explained. Their verbal consent was sought.

Practice

The practice is situated in a purpose-built medical centre on the outskirts of London. There are four principals, two trainees, and a full primary health care team including attached community midwives. The list size is approximately 8500 with between 110 and 140 births each year.

Screening

Screening for depressive symptoms was performed using interactive software on a Commodore 8000 series microcomputer. The programme 'Interact', devised by Ancill and Carr, administers psychiatric questionnaires to patients and records and stores their answers. Questions appear in sequence on the screen and the patient answers using the keyboard.

Patients were asked to complete the Hamilton Depression Rating Scale at routine antenatal clinic appointments, and at regular intervals during the postnatal year. A maximum of 17 screenings per patient were allowed for — in the antenatal period these were monthly until 32 weeks, then fortnightly until term; before six weeks, at six to eight weeks, and in the postnatal period screening was performed two to three, four to six, seven to nine and 10 to 12 months. Few women completed more than 10 assessments owing to the shared system of antenatal care and to the difficulties of getting women to attend at regular intervals in the postnatal year.

Doctors were informed of patients' scores if elevated, but only after the consultation. Previous scores were available during the consultation.

Data collection and analysis

For each patient data on age, social class and previous psychiatric and obstetric history were collected. Further information on out-

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come of pregnancy, perinatal medical problems, breast feeding and clinical psychiatric symptoms was recorded prospectively. These data and each patient's score on the Hamilton Depression Rating Scale were entered into the microcomputer and analysed using the 'Trialmaster' programme.

Associations between variables were examined using contingency tests. Chi-square and Fisher's exact test were used where applicable.

Results

One-hundred and thirty-seven women attended for antenatal care during 1982 — only one was unwilling to participate in the study. Eight women miscarried and two had their pregnancies terminated after booking. Twenty-three women moved from the practice area during the course of the study. Sixteen women failed to attend for more than one screening postnatally, despite requests by letter, and these women were excluded in the analysis of postnatal data. Altogether, antenatal data were available on 108 women, and postnatal data on 92 women (79% and 67% of the original cohort respectively).

Descriptive and demographic features

The following data refer to the 92 women who completed both the antenatal and postnatal parts of the study.

The majority of the women (78%) were aged 25–34 years, and only seven (8%) were aged less than 20 years at the start of the study. Fifty-two percent of the women were in social classes 1 or 2, with only 10% in classes 4 or 5. Only 16 women (17%) were unmarried or divorced. Thirty-three of the women were primiparae and all but one of these were primigravidae. Fourteen women (15%) gave a past history of miscarriage, and 13 (14%) had previously had a termination of pregnancy.

Twenty-nine women (31.5%) had a past history of depression (according to medical records), and all but two of these had been prescribed antidepressants. Five women gave a history of treated postnatal depression. Fifty-four women (59%) had a full-term normal delivery, although in 18 of these labour was induced. The rate of Caesarean section was 15%. Only three babies were born before 36 weeks gestation. Eleven babies were admitted to the special care baby unit and four babies had congenital abnormalities.

Depressive symptoms during pregnancy

Mean scores on the Hamilton Depression Rating Scale for the population tended to rise throughout pregnancy, with a steep rise in the final eight weeks (Table 1). Women scoring above the normal range (>10) and the subgroup scoring above the level normally considered to require treatment (>17) showed the same tendency, with a steep rise in the final eight weeks of pregnancy (Table 1). At booking, 24.3% of women had scores greater than 10 and 5.1% greater than 17, and the peak was reached at 37 to 38 weeks, when 45.8% of women scored more than 10 and 11.9% scored more than 17. Mean scores rose from 7.9 (range three to 22) at booking to 10.3 (range one to 26) at 37 to 38 weeks.

Table 1. Scores on the Hamilton Depression Rating Scale during pregnancy.

Length of pregnancy (weeks)	Number of women screened	Number (%) scoring >10	Number (%) scoring >17	Mean score
8–12	78	19 (24.3)	4 (5.1)	7.9
13–16	34	10 (29.4)	1 (2.9)	8.2
17–20	75	18 (24.0)	3 (4.0)	7.1
21–24	86	29 (33.7)	4 (4.7)	8.5
25–28	98	25 (25.5)	6 (6.1)	8.2
29–32	91	24 (26.4)	6 (6.6)	8.3
33–34	65	26 (40.0)	6 (9.2)	9.7
35–36	67	24 (35.8)	6 (9.0)	9.3
37–38	59	27 (45.8)	7 (11.9)	10.3
39–40+	34	15 (44.1)	2 (5.9)	10.2

Table 2. Scores on the Hamilton Depression Rating Scale following pregnancy.

Time after birth (weeks)	Number of women screened	Number (%) scoring >10	Number (%) scoring >17	Mean score
<8	80	17 (21.3)	5 (6.3)	7.7
9–12	30	8 (26.7)	3 (10.0)	9.2
13–25	59	19 (32.2)	6 (10.2)	8.9
26–38	69	19 (27.5)	7 (10.1)	8.0
39–52	70	19 (27.1)	1 (1.4)	7.3

Table 3. Associations with postnatal scores greater than 10.

Variable	Number of women	χ^2	df	*P*
Two or more antenatal scores >10	90	18.16	1	<0.001
1st trimester score >10	64	2.67	1	NS
2nd trimester score >10	89	14.30	1	<0.001
3rd trimester score >10	83	10.91	1	<0.001
2nd and 3rd trimester score > 10	83	10.14	1	<0.01
Previous history of treated depression	92	3.97	1	<0.05
Admission of baby to special care unit	88	0.21	1	NS
Significant neonatal problem	85	0.10	1	NS
Previous history of miscarriage or termination of pregnancy	86	2.45	1	NS
Birth weight <3 kg	87	2.14	2	NS
Social class 4 or 5	65	0.21	1	NS

df = degrees of freedom. NS = not significant.

Depressive symptoms following pregnancy

Mean scores for the population fell sharply following delivery (Table 2). Thereafter, there was a steep rise between three and six months after birth followed by a fall between nine and 12 months. Table 2 gives the percentages of women obtaining raised scores in the postnatal period.

During the postnatal year, 36 women (39%) had a score greater than 10 on one occasion, and 24 (26%) at least twice. Thirteen women (14%) scored more than 17 at least once, and five (5.5%) at least twice.

Associations with raised postnatal scores

In the 92 women completing the study, there were highly significant associations between raised antenatal and raised postnatal scores (Table 3). Women with two or more scores of greater than 10 in the antenatal period were significantly more likely to have raised postnatal scores of greater than 10 ($P<0.001$). A single raised score in either the second or third trimester was significantly associated with raised postnatal scores ($P<0.001$ in both cases).

At higher scores these associations remained. For postnatal scores of more than 17, there was a significant association with

scores of more than 17 at any time antenatally (χ^2 = 10.21, 1 df, $P<0.01$).

There was a significant association between raised postnatal scores (greater than 10) and a previous history of treated depression (χ^2 = 3.97, 1 df, $P<0.05$). However, there was no apparent association between raised postnatal scores and social class, past history of miscarriage or termination of pregnancy, birth weight, admission of the baby to special care unit or neonatal illness/congenital abnormality.

Characteristics of women with raised scores

The mother's parity appeared to exert an influence on the prevalence of raised scores, and upon the statistical associations before and after delivery. Significantly more multiparous women recorded high scores (greater than 10) both antenatally (χ^2 = 8.42, 1 df, $P<0.01$) and postnatally (χ^2 = 5.67, 1 df, $P<0.02$). For multiparous women there remained significant associations between raised postnatal scores and raised second trimester scores (n = 59, χ^2 = 4.05, 1 df, $P<0.05$), and raised third trimester scores (n = 55, χ^2 = 5.77, 1 df, $P<0.02$). Similar associations for primiparae did not reach statistical significance using Fisher's exact test. Analysis of variance supported a correlation between raised antental and postnatal scores in multiparous women, although this did not reach statistical significance (F = 3.53, P = 0.06).

Of the 36 women who recorded at least one raised postnatal score (greater than 10), only three had neither raised antenatal scores nor a previous history of treated depression. Two of these were primiparae. Of the five women with a past history of postnatal depression, three had elevated postnatal scores and two of these were treated with antidepressants.

Clinical management of patients

The women with high antenatal scores (greater than 10) were interviewed and counselled by the doctors. None were rated ill enough to require antidepressant treatment, the criteria for this being strict owing to their pregnancy. Two unmarried mothers took benzodiazepine overdoses during their pregnancy. Both had maximum antenatal scores of 15 and scored negatively on suicidal ideation. One developed severe postnatal depression requiring treatment.

During the postnatal year, 15 women were prescribed antidepressants (tricyclic compounds or mianserin) by the doctors. Only one of these women did not have at least one elevated postnatal score. A further five women were reported by the doctors to have depressive symptoms, but did not receive drug treatment. All but one of these had at least one elevated score. Of the 13 women who scored more than 17 in the postnatal period, three were not treated with antidepressants but were counselled.

Discussion

This study shows highly significant associations between antenatal depressive symptoms and those developing in the postnatal year. A link between antenatal and postnatal depression was also noted by Playfair and Gowers, who carried out an assessment in the second trimester, but not in the third.[3] A similar association has been suggested by other workers.[10-13] However, Kumar and Robson, whose study was carried out on primiparae, found a high incidence of new cases of depression in the first trimester, but a very low incidence and prevalence thereafter during pregnancy; they found no link with postnatal depression.[5]

Other workers have noted a high prevalence of depressive symptoms in pregnancy. However, the steady increase with a sharp peak in the third trimester found in this study has not been reported before. This rise may have been caused solely by the physical discomfort of pregnancy since the Hamilton Depression Rating Scale takes account of physical symptoms. However, various symptoms occur at all stages of pregnancy, and in the last month are almost universal. Therefore, it seems reasonable to postulate that those women who are more depressed will be more likely to find these symptoms troublesome, hence recording higher scores.

Kaij and colleagues suggested that postnatal depression becomes more likely with increasing parity,[14] and the findings reported here seem to support this. Playfair and Gowers found more depression only in multiparae with a history of previous postnatal depression[3] and Kumar and Robson found more severe and prolonged difficulties in a subsidiary comparison of a group of multiparae in their study.[5]

The study reported here was an observational survey of a condition about which there is still much clinical ignorance. This, in part, explains some of the shortcomings of the study. The omission of data on family relationships and social support is one example. Too many screenings may have been included in the design, and it was difficult to keep track of all the patients at all points of the study. Consequently, many readings were missed and some women had to be excluded from the analysis. These omissions were due to failure of follow up rather than difficulties with the computer.

Despite problems, this method of screening for depressive symptomatology proved feasible within general practice. The computer administered questionnaire is a non-intrusive screening tool which fitted easily into the routine of the antenatal clinic. The computer is trusted by the doctors and in this study was universally acceptable to patients. After some initial data entry problems, the staff found the machines easy to operate.

The Hamilton Depression Rating Scale was selected as a well-validated measure of clinical depression, although it was developed more as a tool for continuing assessment than as a diagnostic instrument.[15] Not all women recording high scores were suffering from depression, and such scores *per se* were not taken as indication for treatment. However, all but one of the patients treated postnatally for depression by the doctors had elevated postnatal scores.

The work of Cox and colleagues suggests limitations in the validity of self-report scales during and after pregnancy.[16] However, the attraction of this method is that it offers a potential means of identifying high-risk mothers during routine antenatal clinics. Clearly, further work to validate these findings is required, and is planned. Although postnatal depression may be a heterogeneous condition, in this study only 8% of cases with elevated postnatal scores arose *de novo* in the postnatal period. The remainder had one or more antecedent factors, notably an increase in depressive symptoms antenatally.

Conclusion

Routine antenatal screening for depressive symptoms utilizing a microcomputer has proved feasible within general practice.

A steady rise in depressive symptoms during pregnancy was found, with a sharp fall in the early postnatal months and a peak postnatal prevalence at six months. High antenatal scores were significantly associated with the development of high postnatal scores.

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