Emotional distress of infertile women in Japan

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Although recent papers have suggested that psychological factors are implicated in the experience of infertility, few studies have assessed this relationship in a sample of Japanese infertile women. This study was carried out in order to clarify whether Japanese infertile women experience emotional distress. A cross-sectional questionnaire study was performed to assess the psychological states of 101 infertile women compared to 81 healthy pregnant women. The hospital anxiety and depression scale (HADS) and the profile of mood states (POMS) were administered. These questionnaires produced scores for depression/dejection, anxiety, aggression/hostility, lack of vigour, fatigue, tension anxiety, and confusion. The HADS and the POMS scores of infertile women were significantly higher than those of pregnant women, except for fatigue score. Infertile women with positive HADS indicating emotional disorders (39/101, 38.6%) were significantly (P = 0.0008, χ² test) more than those of pregnant women (13/81, 16.0%) when the threshold was set at 12/13 of total HADS scores. The HADS scores were not affected by the women's age, duration of infertility, experience of conception, routine tests, and work states. In this Japanese population, infertile women reported higher levels of emotional distress than pregnant women, suggesting psychological support is needed for infertile women.

Key words: distress/emotion/infertility/Japan

Introduction

Recent papers have suggested that psychological factors are implicated in the experience of infertility; however whether stress and infertility are linked as cause or consequence is still uncertain (Greil, 1997). The psychological problems which have been most commonly investigated are anxiety and depression; anxiety because of the stressful nature of the treatment procedures and because of the fear that treatment will fail, and depression because of the inability to conceive (Golombok, 1992). From recent studies, it appears that the major difficulty facing patients during infertility is anxiety (Cook et al., 1989), while couples whose treatment was unsuccessful are instead at risk of depression (Golombok, 1992). High levels of anxiety have been suggested possibly to have a direct effect in reducing conception rates. In particular, a link has been suggested between anxiety-induced hyperprolactinaemia and failure to conceive (Harrison et al., 1986; Edelmann and Golombok, 1989). Domar et al. (1992) have shown that psychological interventions were successful at decreasing anxiety and at improving conception (Domar et al., 1992). However, there is no clear evidence to show that psychological factors contribute towards female infertility.

In Japan, historically, women have been frequently asked such questions as ‘Are you married? Do you have a child?’ without hesitation, because these are forms of greeting. Old people sometimes criticize women without children, because they think women should have heirs bearing their family name, and because they still believe that infertility is caused by the female. Moreover, the media sometimes criticize the new technology of fertilization [e.g. IVF, intracytoplasmic sperm injection (ICSI)], which might result in patients being ashamed of infertility. However, little attention has been paid to the psychological aspects of infertility in Japan. For instance, the Japan Society of Obstetrics and Gynecology has not had a discussion of psychological aspects of infertility at the annual meeting for over a decade. Only one study has been published in English (Chiba et al., 1996) concerning psychological issues among patients with infertility in Japan. Their results indicated that the stress factor for infertile women changed with the length of the infertility period, but they did not compare infertile women to any other group. We postulated that Japanese infertile women had increased stress, resulting in high levels of anxiety and depression. Therefore this study was conducted to clarify whether Japanese infertile women are psychologically disturbed.

Materials and methods

We asked 137 women who visited our infertility clinic in Tokai University Hospital to fill in questionnaires. The subjects filled in the questionnaires during waiting periods at the outpatient clinic. All
women returned the questionnaires (return rate: 100%). In this study, the women with history of any live birth, psychiatric disorders and with other physical diseases concomitantly were excluded. Finally, the subjects were 101 patients (32.9 ± 4.3 years; mean ± SD, range 24–43) who had been infertile for more than 1 year (58.9 ± 40.0 months, range 1–18 years).

As a control population, we asked 105 women who visited our obstetric clinic in Tokai University Hospital to fill in the same questionnaire. The subjects filled in the questionnaires during waiting periods at the outpatient clinic, as the infertile women did. All women returned the questionnaires (return rate: 100%). In our hospital, both the obstetrics and gynaecology outpatient clinics are located in the same section, divided in two parts (right obstetrics, left gynaecology), so that patients have to enter the same entrance and to wait in the same room. About half of pregnant women achieved pregnancy after infertility treatment given in our hospital. Therefore, the condition of two groups was quite similar, and the only difference was whether they were pregnant or not. In this study, the women whose current pregnancy had any problems (e.g. growth retardation, macrosomia, placenta previa, threatened abortion, or preterm labour) as well as women with a history of any psychiatric disorder, intrauterine fetal death in the second or third trimester of a previous pregnancy, or hereditary disease, were completely excluded. Finally, as a control population, we recruited 81 healthy pregnant women (30.5 ± 4.2 years, range 23–41) at 11–39 weeks of gestation (26.6 ± 8.4 weeks).

In order to detect emotional states, we used two questionnaires which have been used commonly for screening psychological distress. The Hospital Anxiety and Depression Scale (HADS) was relatively newly developed for detecting depression and anxiety (Zigmond and Snaith, 1983). HADS is well known to be useful for screening emotional disorders (e.g. adjustment disorders, major depression, anxiety disorder, or dysthymia) regardless of benign or malignant diseases (Andrews et al., 1987; Barczak et al., 1988; Wilkinson and Barczak, 1988; Hamer et al., 1991; Morey et al., 1991). The Japanese version of HADS was introduced by Kitamura (1993); he translated the inventory of the original HADS into Japanese (Kitamura, 1993), followed by retranslation into English by someone who did not know HADS. The retranslation was checked and accepted by the original authors, Zigmond and Snaith. Although we do not have any standardized scores in HADS, there are appropriate threshold points as a screening test in the Japanese version. Kugaya et al. (1998) first reported that the optimal threshold score of total HADS in Japanese was 10/11 for emotional disorders (e.g. adjustment disorder, major depressive disorder) in cancer patients with 92% sensitivity and 65% specificity (Kugaya et al., 1998). Our previous report also revealed that the appropriate threshold score of total HADS in Japanese was 12/13 for emotional disorders in otolaryngology patients with 92% sensitivity and 90% specificity (Hosaka et al., 1999).

The profile of mood states (POMS) has been widely used for measuring emotional disturbances (McNair et al., 1971). The POMS can produce scores for depression/dejection, aggression/hostility, lack of vigour, fatigue, tension anxiety, confusion, and total mood disturbances. The validation study of the Japanese version of the POMS was reported (Yokoyama et al., 1990) and standardized with 5557 normal controls, both male and female, between the ages of 10 and 60 (Yokoyama et al., 1994).

Statistical analysis

Unpaired Student’s t-test was used to compare two groups. The χ² test was performed for 2×2 tables. Correlation coefficient (r) between two parameters was calculated as linear correlation. A P value less than 0.05 was considered statistically significant.

Results

In this Japanese population, all parameters of both the HADS and the POMS except for fatigue score from infertile women were significantly greater than those of pregnant women using unpaired Student’s t-test (Table I). The depression/dejection score of infertile women (10.9 ± 8.7) was twice as much as that of pregnant women (5.0 ± 4.9). The scores of the HADS and the POMS between pregnant women with (n = 40) and without (n = 41) infertility treatment were not statistically significant using unpaired Student’s t-test (data not shown).

The total HADS scores and the subscales of the POMS were well correlated using linear correlation; depression/dejection (P < 0.0001, r = 0.714), aggression/hostility (P < 0.0001, r = 0.630), lack of vigour (P = 0.0004, r = 0.350), fatigue (P < 0.0001, r = 0.525), tension anxiety (P < 0.0001, r = 0.726), confusion (P < 0.0001, r = 0.595), total mood disturbances (P < 0.0001, r = 0.793). Since the HADS and the POMS scores were well correlated, and since the HADS is well known to be useful for screening emotional disorders, we focused on the total score of the HADS. When the threshold point of the total score of the HADS was set at 12/13, positive HADS (i.e. indicating emotional disorders) was observed in 38.6% (39/101) of infertile women compared to 16.0% (13/81) of pregnant women (Table II, P = 0.0008, χ² test). Similar significance was observed with the threshold at 10/11 (Table II, 50.9% versus 33.3%, P = 0.0005, χ² test). Ages between infertile and pregnant groups were statistically different (P = 0.0002, unpaired Student’s t-test), but the age did not contribute to the HADS scores in both groups using

### Table I. Comparison of the HADS and the POMS scores of infertile and pregnant women

<table>
<thead>
<tr>
<th>Scores</th>
<th>Infertile</th>
<th>Pregnant</th>
<th>P valuea</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS depression</td>
<td>4.6 ± 2.9</td>
<td>3.5 ± 2.1</td>
<td>0.003</td>
</tr>
<tr>
<td>HADS anxiety</td>
<td>6.9 ± 3.1</td>
<td>5.3 ± 3.0</td>
<td>0.0007</td>
</tr>
<tr>
<td>HADS (total)</td>
<td>11.6 ± 5.2</td>
<td>8.8 ± 4.2</td>
<td>0.0002</td>
</tr>
<tr>
<td>Depression/dejection</td>
<td>10.9 ± 8.7</td>
<td>5.0 ± 4.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Aggression/hostility</td>
<td>9.4 ± 7.3</td>
<td>7.2 ± 5.5</td>
<td>0.02</td>
</tr>
<tr>
<td>Lack of vigour</td>
<td>29.4 ± 5.8</td>
<td>26.2 ± 5.0</td>
<td>0.0001</td>
</tr>
<tr>
<td>Fatigue</td>
<td>8.3 ± 5.9</td>
<td>8.2 ± 5.0</td>
<td>NS</td>
</tr>
<tr>
<td>Tension anxiety</td>
<td>10.4 ± 6.1</td>
<td>7.6 ± 5.4</td>
<td>0.001</td>
</tr>
<tr>
<td>Confusion</td>
<td>7.9 ± 4.2</td>
<td>6.3 ± 3.0</td>
<td>0.005</td>
</tr>
<tr>
<td>Total mood disturbances</td>
<td>76.3 ± 28.8</td>
<td>60.4 ± 19.3</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Data are shown as mean values ± SD.  
*a Unpaired Student’s t-test was used between groups.  
NS = not significant; HADS = Hospital anxiety and depression scale;  
POMS = profile of mood states.

### Table II. Positive percentage of total HADS scores in infertile and pregnant women

<table>
<thead>
<tr>
<th>Threshold</th>
<th>Infertile</th>
<th>Pregnant</th>
<th>P valuea</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/13</td>
<td>38.6% (39/101)</td>
<td>59.4% (60/101)</td>
<td>0.0005</td>
</tr>
<tr>
<td>10/11</td>
<td>16.0% (13/81)</td>
<td>33.3% (27/81)</td>
<td>–</td>
</tr>
</tbody>
</table>

χ² test compared to pregnant women.
Discussion

In this population of Japanese women, all parameters of both the HADS and the POMS except for fatigue score from infertile women were significantly greater than those of healthy pregnant women. In other words, these results suggested that infertile women were more likely to have higher level of depression, dejection, anxiety, aggression, hostility, lack of vigour, tension anxiety, and confusion. Since anxiety and depression are the psychological problems which have been most commonly investigated, many studies showed that anxiety and depression were frequently observed in infertile women compared to controls (Greil, 1997). Subscales related to interpersonal sensitivity such as aggression or hostility have sometimes been reported in infertile women (Bernstein et al., 1988; Downey and McKinney, 1992), but there were no significant differences between infertile and non-infertile women with regard to personality (Greil, 1997). Our results are consistent with these previous studies in the western world, and we speculate that infertile women with anxiety and depression may induce interpersonal sensitivity and may reduce vigour.

Although we did not perform a psychiatric structured interview to all women in this study, our results showed that significantly more infertile women (38.6%) showed positive HADS scores (i.e. emotional disorders) compared to pregnant women (16.0%) when the threshold was set at 12/13. Our previous report revealed that positive HADS scores were observed in 30% of benign otolaryngology patients and in 46% of those with malignancies (Hosaka et al., 1999). Therefore, we should emphasize that the 38.6% in healthy infertile women is high and the 16.0% in healthy pregnant women is quite low. Since Japanese people think all women who are pregnant will have an intact baby, to be pregnant seems to be a goal. This may explain why the healthy pregnant women had low HADS scores in Japan.

The HADS score of the current study (depression 4.6 ± 2.9, anxiety 6.9 ± 3.1) was similar to the results in a UK population using HADS (depression 4.0 ± 3.6, anxiety 7.9 ± 4.0) (Glover et al., 1999) in spite of the language difference of the inventory, suggesting that not only the Japanese population but also Caucasians have high HADS scores. However, it may not be possible to compare each score directly, because the UK study included both men and women and because the HADS questionnaire used in our study was translated into Japanese.

Since half of pregnant women in the current study group are from our infertility clinic after appropriate treatment, successful pregnancy may reduce those scores or reduced scores may lead to successful pregnancy. Similar results have been reported, indicating that the POMS scores improved during pregnancy compared to the same women before pregnancy (Sanders and Bruce, 1997). If the hypothesis that decreasing HADS/POMS might lead to successful pregnancy is true, the mechanism whereby increased depression and anxiety may lead to infertility may be explained by a link between hormonal changes and the psychological states. There is some evidence showing that anxiety-induced hyperprolactinaemia is associated with failure to conceive (Harrison et al., 1986; Edelmann et al., 1989), and there is other evidence showing that changes in prolactin, cortisol and testosterone provoked by emotional stress vary with anxiety and depression (Demyttenare et al., 1989; Merari et al., 1992).

In this population of Japanese women, duration of infertility, experience of previous conception, routine tests and work did not contribute to the HADS scores. Since some papers have reported that the length of treatment changed emotional stress (Berg and Wilson, 1991; Chiba et al., 1996) or some of the routine tests were stressful (Eimers et al., 1997), emotional states detected by the HADS may not be influenced by these factors.

It may not be suitable to compare infertile women with pregnant women, because the entity is completely different and because both may have special psychological problems. A good comparison group would be a healthy population, such as those female patients who come for a general investigation or a PAP smear. Unfortunately, we have few such patients in our institution. Although we matched the other conditions of the two groups as much as possible, the results from this study are limited by the comparison group of pregnant women. As to the pregnant women whose gestational weeks were different between 11 and 39 weeks, their psychological situations may be different in themselves, but gestational week was not related to the HADS scores using linear correlation (flare test). is some evidence showing that anxiety-induced hyperprolactinaemia is associated with failure to conceive (Harrison et al., 1986; Edelmann et al., 1989), and there is other evidence showing that changes in prolactin, cortisol and testosterone provoked by emotional stress vary with anxiety and depression (Demyttenare et al., 1989; Merari et al., 1992).

To date, gynaecologists are eager to recognize the need to provide psychological care for women with infertility in the western world. Although results from this study are limited by the cross-sectional design and by the comparison group, we conclude that some of the Japanese infertile women are psychologically disturbed. Further research is necessary for detection of the cause of these high scores of the HADS and the POMS and for seeking beneficial treatment for these infertile women.

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References


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