The psychological status at school age of children conceived by in-vitro fertilization

Thomas R. Montgomery1,4, Frank Aiello1, Raymond D. Adelman1, Nadia Wasylshyn1, Mason C. Andrews2, T. Berry Brazelton3, Georgeanna S. Jones2 and Howard W. Jones Jr2

1Department of Pediatrics, 2Department of Obstetrics and Gynecology, Eastern Virginia Medical School, Children’s Hospital of the King’s Daughters, Norfolk, VA 23507, and 3Department of Pediatrics, Harvard Medical School, Boston 02115, USA

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Introduction

At the time of this study, The Jones Institute for Reproductive Medicine at Eastern Virginia Medical School had experience with over 1735 children conceived via in-vitro fertilization (IVF) since having the first successful in-vitro fertilization (IVF) in the USA in 1981. Parents who have sought IVF have pursued an extensive and costly pathway for childbearing. This extreme parental effort has resulted in creation of a population of children that has been labelled ‘premium children’ (Mushin et al., 1985).

Past studies of parents and children from non-traditional childbearing practices have emphasized adoptions. A study of the psychological development of children from donor insemination failed to reveal any difference in children’s psychological development from heterosexual and lesbian mother families (Brewaeds et al., 1997). More recently (Raoul-Duval et al., 1993, 1994), IVF and anonymous oocyte donation families have been studied (Raoul-Duval et al., 1992; Bertrand-Servais et al., 1993). These studies speculate that parents may have altered child rearing practices following IVF because of the stress of infertility, the extensive coping mechanisms used within the family throughout their infertility experience, and the focus on the child as a ‘premium child’ (Mushin et al., 1985).

There are reassuring data on the physical status of IVF children during the first 3 years of life (Yovich et al., 1986; Morin et al., 1989; Raoul-Duval et al., 1990, 1993, 1994). Golombok’s study of parents and children following new reproductive technologies included 41 school age IVF children (Golombok et al., 1995). Behaviour rating scales from parents and teachers of these IVF children revealed scores comparable to the general population.

Only two of the 41 IVF children were reported to have behavioural problems. There have been no other psychological or behavioural studies of school age IVF children. There is anecdotal evidence suggesting that IVF children are socially and emotionally well adjusted and academically advanced as compared to their classmates. The purpose of this study is to confirm the anecdotal evidence that IVF children are free from significant behavioural and emotional problems. The hypothesis is that IVF children will have normal scores on Achenbach behaviour rating scales.

Materials and methods

A total of 787 IVF children were born at the Jones Institute between 1981 and 1990. All were over 4 years old at the time of the study. Five children have died. Thirty-nine children were raised overseas and were excluded because the Achenbach questionnaire forms were standardized on a USA population. Thus, the study population included 743 children.

Three questionnaire forms devised by T. M. Achenbach were used: The Achenbach Child Behavior Checklist 4–18 years, The Teacher Report Form and the Youth Self Report form (Achenbach, 1991a, b, c, d). A national sample of children was used as a control group in the Achenbach questionnaires. The standard organization of data obtained from the Achenbach questionnaires was used. This organization takes the eight problem areas on the questionnaires and groups them into five ‘domains’: (i) internalizing disorders comprised of withdrawn problems, somatic problems, and anxious and depressed problems; (ii) externalizing disorders comprised of delinquent problems and aggressive problems; (iii) social problems; (iv) thought problems; (v) attention problems. The questionnaires were scored by
Results

Questionnaires for 494 (67%) of the 743 were completed. Table I demonstrates the distribution of responses comparing the control group with the study group for each of the five problem domains. Comparison of the control group to the study group for normal scores (less than 85th percentile) and abnormal scores (greater than 95th percentile) for each domain revealed no difference between the two groups. In fact the study group had greater percentages of males and females in the normal category and a smaller percentage in the abnormal category than the control group for every domain.

Figure 1 illustrates the distribution of abnormal responses for males. Ninety three per cent of the males had either none or only one abnormal score. Six boys had four or more abnormal responses. This was only 2.3% of the sample, but accounted for 40% of all abnormal responses reported.

Discussion

Prospective parents for IVF often ask if any resulting child will be physically or behaviourally different from other children. Although there have been studies of the psychological problems related to infertility (Connolly et al., 1992; Golombok, 1992; Berg, 1994; Morrow et al., 1995) and speculation concerning the child-rearing practices of couples that pursue IVF (Mushin et al., 1985; Morin et al., 1989), these studies have failed to look for an increase in behavioural or psychological problems among IVF children of school age. Thus, there are no suitable studies to answer the parent’s question.

In considering such a behavioural study, a major consideration was how to do it. Ideally, one can contemplate a three-armed study: IVF children and their parents, children and parents of infertile couples whose fertility problem was solved short of IVF, and families and children of parents whose fertility was normal.

Such children and families in a study would be ideally standardized measures using software and manual reporting profile forms provided by the manufacturer.

A packet of questionnaires was sent to each family. The youth self report form was sent to families with a child 11 years or older. The questionnaires were completed independently by parents, teachers and children (11 years or older). Any abnormal score on any of the forms was recorded in order to achieve the highest possible number of abnormal responses. Concurrence between parents, teachers, or child was not required to report an abnormality. Scores for each of the behaviour domains was converted into a percentile in accordance with the scoring protocol for the questionnaires. Achenbach defines scores that are less than the 95th percentile as ‘normal’. However, for the purposes of this study, it was elected to narrow the definition of normal by using scores of less than the 85th percentile, that is one standard deviation above the mean, as the definition of normal. Achenbach describes scores of greater than the 95th percentile as possibly clinically significant and scores greater than the 98th percentile, approximately two standard deviations above the mean, as clinically abnormal. For the purposes of this study, scores greater than the 95th percentile were defined as abnormal since such scores may reflect a clinically significant problem.

The control group for this study was the normative sample that was used for establishing the Achenbach behavioural questionnaires. Comparisons for each of the five domains were made between the study group and control group. The questionnaires were created to determine abnormalities of behaviour by generating scores above a normed mean score. Lower than mean scores were not analysed by Achenbach to determine whether they represent better than normal behaviour. Thus abnormalities from the mean extend in only one direction, that is greater than the mean. Therefore the one-tailed t-test was used to compare the study and control groups with significance at the $P = 0.05$ level.

Scores of children from multiple gestation were compared to scores of children from singleton births using the Fisher exact test to determine differences that may be accounted for by multiple gestation.

Non-responders to the packet of questionnaires were contacted by telephone. In order to maximize abnormal responses, the initial conversation was open ended to elicit concerns the parents may have about their IVF child. This was followed by specific questions concerning school achievement, school behaviour and home behaviour. Additional questions were asked concerning emotional well being. Any negative response was recorded as a problem. Non-responders to the questionnaires were compared to responders to determine differences in abnormal scores using the Fisher exact test.
Table 1. Comparison of questionnaire responders to control population for normal and abnormal scores (n = 494)

<table>
<thead>
<tr>
<th>Problem domain</th>
<th>Percentage with normal scores (less than 85th percentile)</th>
<th>Percentage with abnormal scores (greater than 95th percentile)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Male</td>
</tr>
<tr>
<td>Thought problems</td>
<td>85</td>
<td>94.7</td>
</tr>
<tr>
<td>Internalizing problems</td>
<td>85</td>
<td>87.3</td>
</tr>
<tr>
<td>Externalizing problems</td>
<td>85</td>
<td>94.3</td>
</tr>
<tr>
<td>Attention problems</td>
<td>85</td>
<td>94</td>
</tr>
<tr>
<td>Social problems</td>
<td>85</td>
<td>93.8</td>
</tr>
</tbody>
</table>

Figure 1. Number of abnormal responses from Achenbach questionnaires for males, n = 262.

Figure 2. Males with abnormal responses by domain.

Figure 3. Number of abnormal responses from Achenbach questionnaires for females, n = 232.

Figure 4. Females with abnormal responses by domain.

matched for age, educational experience, socio-economic quality, and many other characteristics. A special methodology would have to be created. After many conferences, the authors decided that such an ideal study was simply not fundable and, therefore, not feasible. The Achenbach questionnaire seemed to offer the best feasible alternative and was considered worth doing. From the point of view of the authors, the principal problem with the Achenbach approach was that it offered no way to test any superiority in a behavioural or cultural way.

The Achenbach questionnaires have been documented as effective and accurate assessment tools for multiple domains of behavioural and psychological development (Achenbach et al., 1991; Bird et al., 1991; Stanger et al., 1992; Brown and Achenbach, 1993). The problems scales used in this
study can be represented by percentiles. The 85th percentile represents individuals approximately one standard deviation from the mean. This percentile remains well within the range of normal behaviour scores for the problem scales. Individuals between the 95th percentile and the 98th percentile on the problem scales have scores that suggest the possibility of clinically significant problems. Individuals with scores above the 98th percentile represent individuals with clinically significant behavioural or emotional problems. In this study the 95th score was used as representative of an abnormal response since this ensured that any child with a possibility of clinically significant problems was identified.

The questionnaire responders were representative of the entire IVF school age group from the Jones Institute. There was no statistically significant increase in problems from the telephone responders compared to the questionnaire responders. The non-responders to the questionnaire packet did not appear to be protecting their children from being identified as abnormal. The most common reason given for not completing the questionnaires was that the parents were too busy. Some of the telephone responders were concerned that, regardless of statements of confidentiality, written information from the questionnaires may become disseminated or be available in computer databases and thus did not return the questionnaires.

There was a small number of children (six boys and five girls, 2.3% of the population) who had multiple clinically significant problems. Figures 2 and 4 demonstrate that with multiple behavioural problems, these problems cross all domains and indicate multiple behaviour problems. Further investigation of this small group of children will be necessary to determine whether their status as IVF children contributed to their multiple problems.

The use of an entire packet of multiple questionnaires to search for any possible abnormality in behaviour rate casts the widest net in attempting to discern behavioural problems. Subdividing the study group by ethnicity, socio-economic status, teacher reports or by the child’s knowledge of IVF status was not done. However, the rate of problems in the study group was so low that it would be difficult to postulate that any two samples of the study group divided on these variables would create disparate problem rates.

The increased biological risks that accompany multiple gestation births (Hawrylyshyn et al., 1982; Ghai and Vidyasagar, 1988; McCulloch, 1988; Chen et al., 1993) have not resulted in an increase in behavioural or psychological problems for the IVF children from multiple gestation pregnancies. This may, in part, be a reflection of the special prenatal care these women received.

In summary, the finding from this study that IVF children have no increase in behavioural or emotional problems at school age should be reassuring to everyone involved with IVF. This information is useful for counselling couples contemplating IVF. It provides counsellors with evidence beyond current anecdotal reports that IVF children are free from significant behavioural or psychological problems in the school age years.

References


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