

A preliminary study of parental stress and child behaviour in families with twins conceived by in-vitro fertilization

Rachel Cook^{1,3}, Sally Bradley² and Susan Golombok²

¹Department of Psychology, Anglia Polytechnic University, East Road, Cambridge, CB1 1PT, and ²Family and Child Psychology Research Centre, City University, Northampton Square, London, EC1V 0HB, UK

³To whom correspondence should be addressed

This paper reports on a preliminary study of parenting quality, parental stress and child behaviour in families with twins conceived by in-vitro fertilization (IVF) in comparison with families with naturally conceived twins. No differences were found between the types of family in parenting quality or child behaviour. However, parents whose children were conceived by IVF reported greater stress associated with parenting than parents with naturally conceived twins.

Key words: child behaviour/in-vitro fertilization/parental stress/twins

Introduction

The rate of multiple births in Britain has risen dramatically in recent years, partly as a result of assisted reproduction techniques. Whereas natural conception has a multiple birth rate of ~1%, 19% of in-vitro fertilization (IVF) births are twins and a further 4% are triplet or higher order births (MRC, 1990). Whilst IVF parents may express pleasure at the prospect of twins, the reality may be both physically and emotionally challenging. Mothers of twins have pregnancies and deliveries that are more difficult than average, and subsequently have to deal with two children whose needs may be greater as a result of prematurity and low birthweight (Botting *et al.*, 1990). These demands are reflected in a higher rate of depression amongst mothers of twins in comparison with mothers of singletons (Thorpe *et al.*, 1991).

Although parents who conceive using assisted reproduction do not appear to have unusually high expectations of their children (van Balen, 1996) they may have high expectations of themselves as parents (Mushin *et al.*, 1985) and anticipate greater rewards from parenthood than parents who conceive naturally (Gibson *et al.*, 1996). With singleton children, this may translate into a less rewarding experience of parenting than expected, and hostile or negative feelings towards children when expectations are not met (Condon and Dunn, 1988). Mothers of first-born IVF children have been found to report higher levels of separation anxiety, more behaviour difficulty and more reactivity in their infants than mothers of naturally conceived children (Gibson *et al.*, 1996; McMahan *et al.*,

1996). IVF mothers also report feeling less competent. These differences are not reflected in the quality of the mother–child relationship or in observed child behaviour, and also appear to be confined to infancy. There are now several studies demonstrating that such differences are not evident in early childhood: both parenting quality and children's development in IVF families with older singletons (aged 2–8 years) is comparable, or superior, to that of families with naturally conceived children (e.g. Colpin *et al.*, 1995; Golombok *et al.*, 1995; van Balen, 1996).

It is conceivable, however, that differences in infancy may be perpetuated in families with twins because the task of parenting is so much more demanding. Mothers of twins inevitably have less time to care for their children. Although they do not differ from mothers of singletons in the way that they respond to their children, they do differ in the amount of attention paid to them (Rutter and Redshaw, 1991). Parenting IVF twins may therefore be considerably less rewarding than parents expect and may challenge parents' perceptions of themselves as competent. With IVF singletons, the rewards of parenting may dissipate initial difficulties. However, the demands of twin parenting are not confined to infancy (Thorpe *et al.*, 1991) and difficulties may persist. Families with twins or higher order births have been excluded from most studies of the psychological consequence of assisted reproduction, yet these families may be particularly at risk.

The aim of the present investigation was to examine parenting quality, parental stress and the psychiatric state of children aged 4–8 years in families with twins conceived by IVF in comparison with families with naturally conceived twins. We postulated that whilst mothers of IVF twins would exhibit similar levels of quality of parenting to the mothers of the normally conceived controls, parents would report greater levels of parental stress and greater behavioural and emotional difficulties in their children (in contrast to teachers' reports).

Materials and methods

Subjects

A total of 12 families with twins conceived by IVF were obtained through UK infertility clinics. The control group of 14 families with naturally conceived (NC) twins was recruited via the Twins and Multiple Births Association (TAMBA). All couples were married. There was no significant difference between the proportion of boys and girls in each group (IVF: 14 boys and 10 girls; NC: 10 boys and 18 girls; $\chi^2 = 1.828$; not significant). Within the IVF group, three pairs of twins were girls, five pairs were boys and four pairs were mixed. Eight naturally conceived pairs were girls, four were boys and two were mixed.

The average age of children in the IVF and NC groups was not significantly different (5 years 3 months compared with 4 years 10 months). Similarly, IVF and NC mothers did not differ significantly in age (38 years versus 35 years: $F(1,24) = 4.04$; not significant). However, IVF fathers (mean age, 41 years) were significantly older than NC fathers (mean age 37; $F(1,24) = 6.35$; $P < 0.05$). There was also a significant difference between groups for presence of siblings ($\chi^2 = 3.869$; $P < 0.05$) with more children in the NC group having siblings other than their twin (10 had other siblings, four did not) than children in the IVF group (three had other siblings, nine did not). Similarly, more parents in the IVF group than in the NC were first-time parents: 11 of the fathers and 10 of the mothers in the IVF group were first-time parents whereas only four fathers and mothers in the NC group were first-time parents. Demographic variables which showed a significant difference between groups were entered into the statistical analyses as covariates.

Procedure

Participating families were visited at home where the mother was interviewed and questionnaires left for both parents to complete. Interviews lasted for ~2 h and were tape recorded. In all, 58% of fathers and 88% of mothers returned completed questionnaires. Children's teachers were asked to complete a questionnaire concerning the child's behaviour at school; 67% were returned.

Measures

Quality of parenting

This was assessed using an adaptation of a standardized interview technique developed by Quinton and Rutter (1988). This method has been validated by observational studies and a high level of agreement obtained between observational and interview ratings. The interview covered the child's daily routine, focusing on the child's behaviour and parental responses. Two overall ratings of quality of parenting were obtained from the interview: (i) the warmth of mother to child was rated on a 6-point scale from 0 (none) to 5 (high); and (ii) the emotional involvement of mother and child was rated on a 5-point scale from 0 (little or none) to 4 (high). Further details of these scales can be found in Golombok *et al.* (1995).

Parenting stress

This was assessed for both parents using the short form of the Parenting Stress Index (Abidin, 1990). As well as an overall measure of level of parenting stress, Parent-Child Dysfunctional Interaction (parental perception of the extent to which the child reaches expectations and interactions with the child are reinforcing) and Difficult Child (parental assessment of children's behaviours which make them difficult to manage) were assessed. Test-retest reliability for this measure is high over a 6 month period. Concurrent and predictive validity have been demonstrated for the full-length questionnaire which is highly correlated with the short form.

Children's emotional and behavioural problems

These were assessed using the Rutter 'A' Scale and 'B' Scale, completed by the child's mother and teacher respectively (Rutter *et al.*, 1975). Both questionnaires have good reliability and discriminate well between children with or without psychiatric disorders.

Results

There were no significant differences between groups for mother's warmth or emotional involvement. However, comparisons using one-way analysis of covariance showed a significant difference between groups for parenting stress for both mothers and fathers [$F(1,42) = 4.787$, $P < 0.05$ and

$F(1,26) = 13.584$, $P < 0.01$ respectively], with parents of IVF twins reporting significantly higher levels of stress than parents of NC twins. Significant differences were also found for both subscales of the Parenting Stress Index for fathers. Fathers of IVF twins had higher scores on the Parent-Child Dysfunctional Interaction subscale [$F(1,26) = 4.824$, $P < 0.05$] and the Difficult Child subscale [$F(1,26) = 14.786$, $P < 0.01$], indicating that fathers of IVF twins reported their interactions with their children to be less rewarding, and the children themselves more difficult to deal with, than fathers of NC twins. No significant differences were found on these subscales for mothers.

Comparison of the two groups of twins for 'A' Scale and 'B' Scale scores using one-way analysis of covariance revealed no significant differences. None of the children had scores indicating the presence of psychiatric disorder.

Discussion

Mothers of twins conceived through IVF and those conceived naturally obtained very similar scores on measures of quality of parenting. This is consistent with most previous studies but differs from the findings of Golombok *et al.* (1995) who, using the same measures as the present study, found that IVF mothers expressed greater warmth to their children and showed greater emotional involvement with them than mothers of NC children.

However, with regard to levels of stress associated with parenting, both IVF mothers and fathers reported significantly higher levels of stress than parents of NC twins. In addition, IVF fathers reported more dysfunctional interaction with their children whom they also perceived to be more difficult in comparison with fathers of naturally conceived twins. This contrasts with the findings of Golombok *et al.* (1995) who found that parents of IVF children had lower levels of stress than parents of NC children. These differences in parenting stress were not associated with differences in parents' or teachers' reports of children's behavioural/emotional problems.

The higher levels of parenting stress reported by parents of IVF children may, as postulated, be due to increased parental expectations amongst IVF parents and increased demands of twin parenting. An alternative explanation is that they are a reflection of greater previous parental experience among NC parents: the majority of IVF twins in the study were first-born, whereas most NC twins had older siblings.

In one sense the origin of these differences between IVF and NC parenting is irrelevant, for most couples who have twins following IVF will be first-time parents. The results therefore suggest, first, that families with twins or higher order births should not be excluded from studies of the psychological consequences of assisted reproduction and second, that parents of IVF twins may be in particular need of support. It must however be stressed that this is a preliminary investigation, the sample size is small and rates of return of some questionnaires were relatively poor. It is therefore not possible to draw firm conclusions given that the findings may simply stem from methodological shortcomings. Nevertheless, the findings indicate that the consequences of twin parenting after assisted reproduction warrant further investigation in a larger

study which would enable examination of the influence of factors such as zygosity, birth order, family size and access to social support on the experience of parenting twins during infancy and beyond.

Acknowledgements

The authors would like to thank TAMBA for their help with recruitment of participants and Dr Frances Price for assistance with data collection.

References

- Abidin, R. (1990) *Parenting Stress Index Test Manual*. Pediatric Psychology Press, Charlottesville, VA, USA.
- Botting, B.J., Macfarlane, A.J. and Price, F.V. (1990) *Three, Four and More. A Study of Triplet and Higher Order Births*. HMSO, London, UK.
- Colpin, H., Demyttenaere, K. and Vandemeulebroecke, L. (1995) New reproductive technology and the family: the parent-child relationship following *in vitro* fertilization. *J. Child Psychol. Psychiat.*, **36**, 1429–1441.
- Condon, J.T. and Dunn, D.J. (1988) The nature and determinants of parent-to-infant attachment in the early post-natal period. *J. Acad. Child Adoles. Psych.*, **27**, 293–299.
- Gibson, F.L., Ungerer, J.A., Saunders, D.M. *et al.* (1996) Psychosocial adjustment, child behaviour and quality of attachment relationship, at 1 year post partum for mothers conceiving through IVF. In *American Society for Reproductive Medicine Conference, Nov. 2–6, Boston, Mass., USA*.
- Golombok, S., Cook, R., Bish, A. and Murray, C. (1995) Families created by the new reproductive technologies: quality of parenting and social and emotional development of the children. *Child Dev.*, **64**, 285–288.
- McMahon, C.A., Ungerer, J.A., Saunders, D.M. *et al.* (1996) Psychosocial adjustment and the quality of the mother-child relationship after IVF conception from pregnancy to four months postpartum: an observational study. In *American Society for Reproductive Medicine Conference, Nov. 2–6, Boston, Mass., USA*.
- MRC Working Party on Children Conceived by *In vitro* Fertilisation (1990) Births in Great Britain resulting from assisted conception, 1978–1987. *Br. Med. J.*, **300**, 1229–1233.
- Mushin, D., Spensley, J. and Barreda-Hansen, M. (1985) Children of IVF. *Clin. Obstet. Gynecol.*, **12**, 865–876.
- Quinton, D. and Rutter, M. (1988) Parenting breakdown: the making and breaking of intergenerational links. Avebury Gower, Aldershot, UK.
- Rutter, M., Cox, A., Tupling, C. *et al.* (1975) Attainment and adjustment in two geographical areas: I. The prevalence of psychiatric disorder. *Br. J. Med. Psychol.*, **37**, 133–141.
- Rutter, M. and Redshaw, J. (1991) Growing up as a twin: twin-singleton differences in psychological development. *J. Child Psychol. Psych.*, **32**, 885–895.
- Thorpe, K., Golding, J., MacGillivray, I. and Greenwood, R. (1991) Comparison of prevalence of depression in mothers of twins and mothers of singletons. *Br. Med. J.*, **302**, 875–877.
- van Balen, F. (1996) Child-rearing following *in vitro* fertilization. *J. Child Psychol. Psych.*, **37**, 687–693.

Received on August 1, 1997; accepted on August 17, 1998