Objective birth data and the prediction of child abuse

J F MURPHY, JANE JENKINS, R G NEWCOMBE, AND J R SIBERT

Llandough Hospital, Penarth, South Glamorgan, County of South Glamorgan Social Services, Cardiff, and Department of Medical Statistics, Welsh National School of Medicine, Cardiff

SUMMARY The Cardiff Births Survey contains objective data that are easily collected and are reproducible between observers. We have compared survey records of 80 abused children with those of 80 control children. Of 44 factors that were examined 11 were appreciably more common in abused children. Such factors included the fact that the baby was preterm and had been admitted to a special care baby unit. Other factors were young maternal age, marital instability, low social class, and maternal smoking. 66% of abused children had at least 5 of these factors compared with only 16% of the control group.

Child abuse is one of the most distressing conditions encountered in paediatric practice. Management is difficult and therefore prevention is very important. If families especially at risk could be identified early, a programme of support might be instigated. This has already been found to be successful on a small scale.1

There have been several excellent studies2 3 on factors in the family, both psychological and social, which predispose to child abuse. However, most of these involve the use of a subjective judgement on personality and behaviour that would be difficult to apply on a large scale. Lynch and Roberts,4 studying the problem in Oxford, found that 5 factors were appreciably more common in abused children than others. These factors included objective factors—such as a very young mother and admission of the baby to a special care baby unit—but they also included subjective factors—such as evidence of emotional disturbance, and recorded concern over the mother's ability to care for the child.

The Cardiff births survey,7 is a well-established collection of medical and social data on each pregnancy, birth, and postnatal period in South Glamorgan. The information is collected by clerks and is entirely factual and does not require subjective judgements. We therefore made use of it to compare birth data on abused children with those on controls in the hope of identifying children at risk.

Patients and methods

Abused children. The names and dates of birth of 80 children on the South Glamorgan Area Review Committee Child Abuse Central Register were obtained by one of us (J J). This register has been in operation since October 1975. Each of these children had either been physically injured or had suffered clear neglect. Each was under age 5 years when the abuse took place. They had been born in Cardiff hospitals between 1970 and 1976, and their families lived in South Glamorgan.

The record of each child was obtained from the Cardiff Births Survey. This gave information about the mother's antenatal care, labour, and postnatal course. In addition it also gave general data on the mother's health, family background, and the health of the infant.

Once we knew the child's date of birth, we could obtain a printout of all children of the same gender born in Cardiff the same day. We then obtained the birth record that corresponded to the identifying number, and thus the record of the child in question was obtained.

Controls. The birth records of 80 control children were obtained. Each control was matched for date of birth and gender. The birth records of the cases and controls were then analysed manually.

Results

Of 44 items examined, the following 11 showed significant statistical differences between abused children and controls. These are placed in three groups.

(1) General characteristics.

Social class

On the Cardiff Births Survey social class is recorded
according to the occupation of the father. If the mother is single, occupation of the mother's father is used. Social classes are shown in Table 1. There were 44 abused children from families rated as Social Class IV, V, unemployed, or unknown, compared with 20 in the control group ($\chi^2=6.18, P<0.05$).

**Marital instability**
This factor comprised two separate items—namely marital status (at delivery), and years of married life (at delivery).
Only 24 of the abused children were from first marriages of more than 24 months' duration at the time of delivery compared with 52 of the control children ($\chi^2=17.19, P<0.001$).

**Age of mother at delivery**
Table 2 shows the ages of the mothers at delivery. There were significantly more mothers <20 years in the group of abused children ($t=5.71, P<0.001$).

(2) **Pregnancy.**

**Period of gestation at booking**
Twenty-three of the mothers of abused children had made their first antenatal visit later than 20 weeks compared with 7 mothers in the control group ($\chi^2=9.48, P<0.01$).

**Number of antenatal attendances**
Thirty mothers of abused children had made fewer than 5 antenatal visits compared with 5 mothers in the control group ($t=5.33, P<0.001$).

**Attendances at preparatory classes**
Seventeen mothers of the control group had attended preparatory classes, compared with 6 of the abused group ($\chi^2=5.08, P<0.05$).

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### Table 1 Social class

<table>
<thead>
<tr>
<th>Group</th>
<th>Social class</th>
<th>Students, Armed forces</th>
<th>Unemployed</th>
<th>Not known</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I   II  III  IV  V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abused</td>
<td>0  5 28 14 18 3</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>4  9 46 9 7 1</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

---

### Table 2 Age of mother (at delivery)

<table>
<thead>
<tr>
<th>Group</th>
<th>Age of mother (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16-17 18-19 20-24 25-29 30-34 35-39 40-44</td>
</tr>
<tr>
<td>Abused</td>
<td>10 20 39 8 2 1 0</td>
</tr>
<tr>
<td>Control</td>
<td>3 13 16 31 9 6 2</td>
</tr>
</tbody>
</table>

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### Maternal smoking habits during pregnancy

Smoking was significantly more common among mothers of the abused group. There were 43 mothers who did not smoke in the control group compared with 19 in the abused group ($\chi^2=13.93, P<0.001$).

(3) **The baby.**

**Gestation**
The periods of gestation are shown in Table 3. There was a significantly greater number of preterm infants (<37 weeks) in the abused group ($t=2.21, P<0.05$).

**Birthweight**
The birthweights are shown in Table 4. There were fewer infants weighing <2500 g in the abused group ($t=9.35, P<0.001$).

**Admission to special care baby unit**
Twenty-three of the abused group had been admitted to a special care baby unit, compared with 11 of the controls ($\chi^2=4.52, P<0.05$).

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### Table 3 Duration of gestation

<table>
<thead>
<tr>
<th>Group</th>
<th>Gestation (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35 36 37 38 39 40 1</td>
</tr>
<tr>
<td>Abused</td>
<td>0  7  8  3 10  11  3</td>
</tr>
<tr>
<td>Control</td>
<td>1  6 11 13 16 9 3 0 0 0 0 0 0 1 0 0</td>
</tr>
</tbody>
</table>

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### Table 4 Birthweights

<table>
<thead>
<tr>
<th>Group</th>
<th>Birthweight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1001 1501 2001 2501 3001 3501 4001 4501 5001 +</td>
</tr>
<tr>
<td>Abused</td>
<td>4 1 11 26 29 7 2 0 0</td>
</tr>
<tr>
<td>Control</td>
<td>0 1 6 12 34 20 5 1 1</td>
</tr>
</tbody>
</table>

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### Table 5 Number of risk factors

<table>
<thead>
<tr>
<th>Group</th>
<th>Risk factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0  1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>Abused</td>
<td>0 2 3 8 14 15 15 14 4 3 2 0</td>
</tr>
<tr>
<td>Control</td>
<td>1 10 30 10 16 6 5 2 0 0 0 0</td>
</tr>
</tbody>
</table>
Discussion

We found significant differences in 11 criteria collected at birth between the mothers of abused children and a matched control group. The importance of young maternal age was stressed by Lynch and Roberts. They also found that admission to a special care baby unit was an important risk factor. This is a worrying observation in view of the fact that more infants are now being admitted to such units. Smith et al. found significant social class differences in their Midland study. In addition they noted differences in marital status and breast feeding between their abused and control groups. Clearly marital stability and breast feeding are protective for the young infant. We know of no other study that showed that smoking during pregnancy was a risk factor. This finding is clearly related to social class. However if adjustments for social class are made there would still be a difference between the smoking habits in the two groups. Thus it may be an index of stress in the mothers in the abused group.

Maternal age, marital status, and antenatal attendances are clearly the easiest factors to identify but, sadly, a score weighted to take account of the degree of significance of each item does not add to its sensitivity.

All information used in this study had been recorded routinely for each infant without causing offence or worry to the mother. It should be possible to use such information to identify infants at risk from child abuse, either formally or informally.

If a formal approach were adopted it would mean that a register would need to be kept and this would pose a number of problems. Firstly, how many points would a family need to score in order to be placed on the register? (Table 5). For example 66% of the abused group had at least 5 factors compared with 16% of the control group (t = 8.58, P < 0.001). This lack of precision is far from satisfactory and many cases of child abuse would be missed and unnecessary anxiety and embarrassment would be caused to some normal families. Secondly, there would be a heavy burden on the already overtaxed social services because all 'at risk' families would have to be supervised and visited regularly. Thirdly, it would be difficult to decide whether parents should be informed that they were being placed on an 'at risk' register.

An informal flexible approach would probably be more acceptable. All people concerned in the care of the young infant and his family (that is, health visitors, social services, general practitioners, paediatricians etc), should be made aware of the risk factors for child abuse. If they encounter families where these risk factors seem to be present, appropriate social and medical support should be instituted. We hope that in this manner the number of cases of child abuse will be reduced.

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References


Correspondence to Dr J R Sibert, Llandough Hospital, Penarth, South Glamorgan CF6 1XX.

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J F Murphy, J Jenkins, R G Newcombe and J R Sibert

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