The Current Epidemiology of SIDS in Ireland

Abstract:
This paper examines some epidemiological factors associated with SIDS to give a general profile of SIDS cases occurring in Ireland between the years 1993 to 1997. There has been a dramatic decrease in the incidence of the Sudden Infant Death Syndrome (SIDS) in the Republic of Ireland in the last decade from an average rate of 2.2/1000 live-births in the 1980s to 0.8/1000 live-births in the years 1993-1997, a decrease of 100 deaths a year. The fall in the SIDS rate has been seen in many countries and is felt to be associated with Reduce The Risks (RTR) of SIDS campaigns and the avoidance of the prone sleeping position. The use of the prone sleep position averaged at 6% of children being put prone in the years 1993-1997 but the prone position has progressively decreased from 13% of children being put prone in 1994 to only 2% in 1997. The profile of the Irish SIDS cases is similar to that of SIDS cases in other countries following similar RTR campaigns with a male predominance, the characteristic clustering of deaths in the first six months of life and the majority of cases (75%) occurring in the night sleep period. The loss of the seasonal variation of the time of death is also shown and factors such as lower socio-economic status, unemployment and medical card eligibility were seen in higher proportions in SIDS families than in the general population. A high percentage of SIDS mothers smoked (73%). Higher smoking rates were seen among younger and single mothers and smoking rates were inversely related to educational level and socioeconomic grouping. An urgent question that needs to be addressed is how socioeconomic disadvantage increases the SIDS risk and what factors influence socioeconomically disadvantaged families to adopt life style and parenting practices such as smoking that influence their children's health.

Introduction

The Current Epidemiology of SIDS in Ireland

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The Sudden Infant Death Syndrome (SIDS) is any death occurring in an infant or young child which is unexpected by history and in which a thorough post mortem examination fails to demonstrate an adequate cause of death. It remains the leading cause of post-neonatal mortality in children throughout Europe. The epidemiology of SIDS in the Republic of Ireland had been documented since 1992 by the National Sudden Infant Death Register which collects information on all Sudden Unexpected Deaths (SUDS) in infants and young children. A system of notification appropriate for each Health Board Area ensures that relevant deaths are reported to the Register by professionals within 48 hours of the time of death. The parents are subsequently invited to participate in a home interview which provides information on socio-demographic data, pregnancy, the infants medical history, the home environment, current parenting practice and details of the events surrounding the infants death. Each case is interviewed by one of two researchers. Death certificates are made available by the Central Statistics Office (a procedure facilitated by the Department of Health) and postmortem reports are also forwarded to the Register for complete ascertainment of all SIDS cases.

The aim of this paper is to give a general description of the epidemiological profile of SIDS cases that occurred in the Republic of Ireland between 1993 and 1997.

**Results**

During the period, January 1993 to December 1997, 234 cases of SUDS were notified to the Register and 202 (86.3%) of these were classified as SIDS cases after a postmortem examination. Of these 202 cases, 151 families (75%) participated in a home interview.

**SIDS Rate and Infant Mortality:** Fig 1 shows the national SIDS rate in the Republic of Ireland for the period 1980 to 1997. The peak incidence was in 1986 with an incidence rate of 2.5/1000 livebirths. Between 1980 to 1989 there was an average of 140 SIDS deaths a year giving a rate of 2.2/1000 livebirths. From 1990 the rate declined steadily and from 1993 to 1997 it averaged at 0.8/1000 livebirths (an average of 40 deaths a year). This decline resulted in 100 less SIDS cases per year.

Between 1993 to 1997 there were 1488 infant deaths in Ireland of which 1008 died in the neonatal period and 480 in the postneonatal period. Twenty one SIDS cases died in the neonatal period (2.1% of all neonatal deaths) and 175 died in the postneonatal period (36.5% of postneonatal deaths).

**Age Distribution:**

The age distribution of the 202 SIDS infants at the time of death is shown in Fig 2. More than half the children (59.4%) died between two and four months. In addition, 2.9% of infants died over the age of one year and 10.4% of infants died in the first month of life. The majority of SIDS cases (82.7%) died in the first six months of life.

**Time of Death:**

The majority of SIDS cases (74.7%) occurred during the night sleep period (22:00 to 8:00) with 12.7% occurring between 8:00 to 12:00, 8% between 12:00 and 18:00 and 4.5% between 18:00 and 22:00 hours.

**Sex Incidence:**

The male predominance in SIDS continues with a male:female ratio of 1.7:1.

**Seasonal Variation:**

There was no seasonal variation with ninety eight (48.5%) of all SIDS cases occurring during the colder six months (January to March and October to December) of the year and the remainder (51.5%) occurring during the warmer six months from April to September inclusive (Fig 3).

**Daily Variation:**

The highest incidence of deaths occurred on Sundays (18.8%) while Fridays (14.9%) and Saturdays (14.9%) also showed an excess of deaths compared to the rest of the week (range 12.4% to 13.4%). This difference was not significant (p=0.65123).

**Geographic Distribution:**

There was little difference in the rate of the SIDS cases in the different Health Board Areas.

**Perinatal Factors:**

Perinatal factors including gestational age, birthweight and maternal age at time of delivery for the 202 SIDS cases were compared with the figures available for all liveborn infants during the same period and results are shown in Table 1. SIDS infants were more likely to be born prematurely (less than 37 weeks of gestation p < 0.001) and to families who were eligible for medical cards (59.7% vs 35.2%; p<0.0001)

| Socio-Demographic Details: A sociodemographic profile of the SIDS cases compared to the general population (Table 1) also revealed a number of differences, SIDS infants were more likely to be born to single parent families (38.3% vs 22.9%; p < 0.0001) and to families who were eligible for medical cards (59.7% vs 35.2%; p<0.0001). Medical card eligibility is means tested (based on the family household income) and entitles the family to free medical services funded by the Government. Families were classified into socio-economic groups (SEG) based on the paternal occupation. The following list shows the different categories of the socioeconomic groups: |
|---|---|
| Code No SEG | Description |
| 0 | Farmers, farmers relatives and farm managers |
| 1 | Other agricultural occupations and fishermen |
| 2 | Higher professional |
| 3 | Lower professional |
| 4 | Self employed, employs others and managers |
| 5 | Skilled manual workers |
| 6 | Semi-skilled manual workers |
| 7 | Unskilled manual workers |
| 8 | Other non-manual workers |


The following list shows the different categories of the socioeconomic groups:

- **SEG 0**: Farmers, farmers relatives and farm managers
- **SEG 1**: Other agricultural occupations and fishermen
- **SEG 2**: Higher professional
- **SEG 3**: Lower professional
- **SEG 4**: Self employed, employs others and managers
- **SEG 5**: Skilled manual workers
- **SEG 6**: Semi-skilled manual workers
- **SEG 7**: Unskilled manual workers
- **SEG 8**: Other non-manual workers

SEG 2-5 were grouped as High SEG and SEG 6-X as Low SEG. Farmers were categorised as a distinct group because their SEG did not reflect the size of their farms and therefore they could not be assigned to either the Low or High
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The SIDS rate in the Republic of Ireland has dramatically declined from a rate of 2.2 per 1000 livebirths in the 1980s to 0.8 per 1000 livebirths from 1993 to 1997 resulting in 100 less SIDS cases a year. A similar reduction in SIDS rates has been seen in many countries introducing campaigns to reduce the risk of SIDS. Whether this reduction reflects a natural variation in the SIDS rate or whether it is due to the effects of several campaigns to reduce the risk of cot death has now been the subject of debate with most authors favouring the former. However, whether this reduction in the use of the prone sleeping position may have led to a decrease in the number of deaths is postulated to be due to a natural variation in the SIDS rate.

Table 3a Distribution of SIDS Mothers Smoking by Age

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>% Smoking(n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>92.9%(13)</td>
</tr>
<tr>
<td>20-24</td>
<td>73.8%(31)</td>
</tr>
<tr>
<td>25-29</td>
<td>73.6%(39)</td>
</tr>
<tr>
<td>30-34</td>
<td>68.6%(24)</td>
</tr>
<tr>
<td>35</td>
<td>65%(13)</td>
</tr>
<tr>
<td>P = 0.04</td>
<td></td>
</tr>
</tbody>
</table>

More than half (53.3%) of parents placed their children to sleep on their side while 35.5% placed them on their backs. The prone position is still being used for 5.9% of children. When the five years were compared to each other, the side position was the most frequently used between 1993 to 1996 (55.4%, 64.3%, 51.8%, and 34.5% respectively) with the back becoming the most frequently used position (53.2%) in 1997. The prone position decreased from 12.9% in 1994 to only 2.1% in 1997.

Table 3b Distribution of SIDS Mothers Smoking by Education Level

<table>
<thead>
<tr>
<th>Education Level (Total n)</th>
<th>% Smoking(n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary (n=7)</td>
<td>71.4%(5)</td>
</tr>
<tr>
<td>Secondary (n=53)</td>
<td>80.2%(33)</td>
</tr>
<tr>
<td>Technical/other (n=13)</td>
<td>68.4%(26)</td>
</tr>
<tr>
<td>Third level (n=14)</td>
<td>28.6%(4)</td>
</tr>
<tr>
<td>P = 0.0005</td>
<td></td>
</tr>
</tbody>
</table>

The seasonal variation of the time of death with an excess in the winter months previously documented has now largely disappeared. Decreased use of the prone sleeping position may have led to a decrease in the number of deaths occurring particularly during the winter months. Douglas et al showed that even though the SIDS rate has fallen dramatically, seasonality still occurs especially in babies 5 months old. This again supports the supposition that there are different aetiological factors for SIDS.

More deaths occurred on Sundays than any other day of the week, similar to other studies. Williams et al showed that the protective effect of sharing a room with an adult was less at weekends than at weekdays and it has been suggested that parents sleep more deeply at weekends making them less responsive to their infants needs. Going to a party at weekends, binge drinking and being an unmarried mother were also risk factors for SIDS occurring at weekends.

SIDS infants were significantly lighter at birth and more premature than the general population of livebirths during the same time period. These results are in keeping with the widely accepted belief that infants born prematurely and/or with evidence of growth retardation at birth are at a higher risk of SIDS.

 SEG. More SIDS infants came from families of lower socio-economic status than would be expected from the national figures (81.9%, p < 0.0001; Fig 4). When the SEG of SIDS families (only infant SIDS) was compared with that of families whose infants died from other causes during the same time period, SIDS families were still of a lower SEG (82.7% vs 60%; p = 0.0001). The unemployment rate among fathers of SIDS infants was 27.5%, compared to the national unemployment rate of 17.3% for all men aged 15 years and over during the years 1993 - 1997 and this difference was statistically significant (p < 0.0001).

Risk Factors: The two main risk factors associated with SIDS i.e. maternal smoking and the prone sleeping position were examined. Tables 3a to 3c show some characteristics of smoking mothers. One hundred and twenty one (72.9%) mothers smoking during pregnancy and the younger the age group the more likely it was for the mother to smoke even though the difference between the age groups was not statistically significant (p = 0.4). The percentage of women smoking was also inversely related to education level (p = 0.0003) and SEG (p = 0.01). Single mothers also tended to smoke more than married mothers (p = 0.0007). Almost 38% of mothers smoked more than 15 cigarettes per day with 19.3% smoking 11-15 cigarettes, 29.4% smoking 6-10 cigarettes and 13.4% smoking 1-5 cigarettes per day.

Table 3c Distribution of SIDS Mothers Smoking by Maternal Socioeconomic Group

<table>
<thead>
<tr>
<th>SEG (Total n)</th>
<th>% Smoking(n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 2-5</td>
<td>43.8%(7)</td>
</tr>
<tr>
<td>1, 6-X</td>
<td>73.9%(99)</td>
</tr>
<tr>
<td>P = 0.01</td>
<td></td>
</tr>
</tbody>
</table>

The male predominance of SIDS persists, a finding also noted in other countries and the risk factors identified in most epidemiological studies are not the reason for the increased SIDS mortality in males.

Most population studies show the age at death of SIDS cases to be a unimodal distribution with a peak around 12 weeks. Most population studies show the age at death of SIDS cases to be a unimodal distribution with a peak around 12 weeks and is postulated to be due to a maturational defect and is postulated to be due to a maturational defect.
The profile of the SIDS mothers showed a high proportion to be smokers and also to be young and unmarried. The high risk associated with smoking has been documented in several studies12-15 but the exact relationship between young maternal age and social deprivation with the risk of SIDS needs to be studied further. These two latter characteristics may be common in lower SEG and could be indirectly related to SIDS through social and environmental factors.

In this study SIDS infants were more likely to come from socially deprived circumstances as evidenced by the higher prevalence of single parent families, paternal unemployment, medical card eligibility and socio-economic status of the affected families. While this finding has been noted in previous studies16-19 it has never been reported in this country. The present breakdown of SIDS families reflected that of the general population while today the same does not hold true19. The present challenge is to understand how social deprivation influences both the parents and the child. It is well known that SIDS babies are born weight and premature infants and parental parenting practices which may contribute to the increased risk of SIDS. It may be due to a higher incidence of the known risk factors for SIDS among disadvantaged communities such as smoking20 or it could be related to unfavourable housing facilities which could make children more vulnerable in a variety of ways including more respiratory infections.

Conclusion

The rate of SIDS has dramatically declined in the last number of years coinciding with campaigns highlighting the association between prone sleeping and smoking and SIDS. SIDS remains the leading cause of post-neonatal mortality in Ireland today. The profile of Irish SIDS cases is similar to that from other countries following RTR campaigns. The increase in the SIDS risk for families of lower socio-economic status has not been previously reported in this country. This study stresses the importance of continually monitoring trends in SIDS over time as changes in the epidemiology of SIDS may provide us with valuable information regarding aetiology and assist us in identifying the risk groups which may benefit from targeted educational programmes.

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References