Perinatal risk factors for neonaticide and infant homicide: can we identify those at risk?

Michael Craig MRCOG MRCPsych

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Infant homicide is a legal term that refers to killing of a child in the first year of life. Infanticide, as defined by the Infanticide Act, is when a mother '*causes death of her child under the age of 12 months by wilful act or omission, but at the time of the act or omission the balance of her mind was disturbed by reason of her not having fully recovered from the effect of her having given birth to the child or by reasons of the effect of lactation consequent on the birth of the child*'. Neonaticide is not specifically defined by the Infanticide Act, but in medical publications usually refers to the killing of a child during the first 24 hours of life.[2]

It is very difficult to get accurate figures on the incidence of neonaticide and infant homicide since many cases are never discovered; official figures are likely to be an underestimate.[2,3] In addition a controversial body of evidence suggests that somewhere between 2% and 10% of cot deaths may ultimately be attributable to infant homicide.[4] Resnick[2] has suggested that 'hundreds and possibly thousands of neonaticides' still occur in Britain each year. Official figures, however, estimate the incidence of infant homicide in Britain to be between 30 and 45 per year[5,6] with neonaticide accounting for 20–25% of the discovered victims[7] and almost 15% of the remaining infant homicides occurring in the following 4 weeks.[5] Even these conservative figures mean that infants have a much greater risk of becoming the victim of homicide than any other age group.[8]

In view of the large number of homicides during the immediate postnatal period, are there any antenatal risk factors that might be used to aid in the prevention of future deaths? Following a review of world publications from 1751 to 1968 and from experience in three of his own cases, Resnick[2] suggested that the motives behind neonaticide and infant homicide are inherently different: whereas neonaticides are committed 'simply because the child is not wanted', he argues that most infant homicides are motivated by 'altruistic' reasons, which attempt 'to relieve the victim of real or imagined suffering'. Subsequent studies have supported the proposal that the motivations differ, but suggest that most infant homicides are due to a sudden loss of temper with the child[9] and not altruism. If the motivation behind neonaticide and infant homicide differs, the risk factors for committing these offences may also differ. This paper will therefore analyse these offences independently.

Room E209, PO 50, Department of Psychological Medicine, Institute of Psychiatry, De Crespigny Park, London SE5 8AF, UK

E-mail: m.craig@iop.kcl.ac.uk

NEONATICIDE

The practice of neonaticide seems to have been widespread in many ancient civilizations. Evidence of ritual killing of babies with structural or aesthetic abnormalities has been documented amongst the Aztecs, ancient Chinese, the Mardudjara Aborigines of Australia and some African cultures.[10] In ancient Greece and ancient Rome, neonaticide was in some instances actually enforced by law. Weak or deformed babies were destroyed for eugenic reasons and because they would be a burden on the state.[11] In the rest of Europe, however, there is little reliable information until the medieval era. In medieval England neonaticide was common.[12] In addition, the census figures of this time 'showed a very marked predominance of male children over female children, strongly suggesting deliberate female infant homicide'.[11] These figures mirror those currently found amongst certain Eskimo tribes in Canada,[13] in the states of Tamil Nadu, Rajastan and Bihar in India[14] and in China.[15] Various explanations have been offered, ranging from a simple 'preference of sons'[10] or the wish 'to exert male dominance over the household',[16] to economics whereby in some cultures females are seen as liabilities rather than assets. In addition, female infant homicide has been seen by some as the most effective method of population control.[17]

The historical evidence thus points to three risk factors for neonaticide—female gender; economics; and congenital abnormality. What is the evidence that these are relevant today? Analysing neonaticide rates in England and Wales from 1982 to 1988 Marks and Kumar[5] found that the victims were equally likely to be girls (n=20) as boys (n=25); thus, *gender* seems not a risk factor in contemporary clinical practice in Britain. Whether there was an *ethnic* bias amongst the female infant homicides is not clear from the study, but this seems unlikely.

Regarding economics, it has been suggested that most neonaticidal mothers are financially poor,[18] but in recent

studies[5,11,19] the contribution of economic circumstances has not been examined directly. Neonaticide has been shown to be more common amongst teenage mothers than older mothers[11,19] and in those with low levels of education.[20] Although these factors *may* be associated with poverty, the connection remains uncertain. Finally, there are no data to suggest that congenital abnormalities are overrepresented among today's victims of neonaticide. Thus, the historical work has been unhelpful in providing risk factors for modern application. Of greater potential value are a series of factors that appear strongly associated with neonaticide. In a study of 11 neonaticides in Britain between 1970 and 1975 D'Orban[9] found that 45% of the mothers were *primiparous*, and a larger study from the USA gave a higher figure: looking at 139 cases perpetrated between 1983 and 1991, Overpeck and colleagues noted that 65% were primiparous. As already mentioned, mothers who commit neonaticide are also more likely to be young. In the study by Overpeck, half were less than 19 years. Almost 90% of women in this age group were primiparous, so the excess of primiparity may largely reflect their youth. Overpeck and colleagues also recorded that about 35% of neonaticide victims had been born before term. Teenage women are, however, at excess risk of preterm delivery,[21] so this again may not represent a true risk factor.

A further risk factor associated with age that is highlighted in many case report studies is the frequent observation that women are *single*[2] and *still living at home with their parents*.[22,23] In addition there is often a suggestion of there being *limited communication* between the young mother-to-be and her family.[22] In some families this is blamed on a 'strict fundamentalist upbringing'[22] or a 'parent committed to his religious ideas'.[24] Other studies have, however, focused 'blame' on the personal characteristics of the woman—for instance, being *immature*,[25] *timid*,[26] *below average intelligence* or *passive*.[27] Gummersbach[27] proposed that passivity is a factor determining whether a woman commits neonaticide rather than having a termination of pregnancy An alternative explanation is the coping strategy of *denial* employed by many adolescents.[23,26] The normal signs of pregnancy may be 'rationalized away', complications such as vaginal bleeding misinterpreted.[28–31] The capacity for denial may be so powerful that labour pains have been interpreted as colic or menstrual pains, and the delivery as a bowel movement.[3]

A common characteristic of women who commit neonaticide involves concealment of their pregnancy.[26] Numerous instances have been reported, and these presumably deal only with cases in which concealment has ultimately failed. In D'Orban's study,[9] all the mothers went on to hide the body of their victim.

Others seeking explanations for why these women do not seek an abortion have proposed that neonaticide is a 'terminal abortion' procedure[20] and that the risk is greatest in societies with strict anti-abortion laws.[2] Jason and colleagues[32] found that neonaticide was more common in rural communities where abortion was suggested to be less socially acceptable. Lester[33] noted a decrease in neonaticide following a relaxation of abortion laws in the United States. A later study,[34] however, looking at data from 39 nations, did not find an association between the strictness of abortion laws and the incidence of neonaticide. Moreover, in England and Wales the incidence of infant homicide changed little after 1985[5] despite passage of the Abortion Act 1967.

Resnick has stated that the stigma of having an *illegitimate* child is 'the primary reason for neonaticide in unmarried women today as it has been through the centuries'. This suggestion is backed up by D'Orban's finding that, in 24 cases of neonaticide, all but one of the victims was born out of wedlock. Against a causal connection is the unchanging incidence of infant homicide at a time when the stigma of having an illegitimate child has greatly lessened; some may say, however, that amongst young teenage women living at home the stigma of an illegitimate child is as great as ever. Although neonaticide has been described at the hands of married women, the most frequent reason is extramarital paternity.[2]

One of the common misconceptions about women who commit neonaticide is that there is an underlying *psychiatric illness*. This is embodied in the Infanticide Act, initially passed in 1922 and reformed in 1938. This Act reduced the offence of infanticide from murder to manslaughter. It fails, however, to distinguish between neonaticide and infanticide. In Resnick's study[2] only 17% of the women who committed neonaticide were psychotic. D'Orban[9] found that just 3 out of 11 women who committed neonaticide had a psychiatric abnormality at the time of their act; 2 were said to have a 'personality disorder' and the other was judged 'subnormal'. Childbirth was almost certainly not causal in either of these conditions. Despite this, all but one woman (whose baby survived) were dealt with under the Infanticide Act 1938. In practice, it would therefore appear that the severity of abnormality needed to fulfil the criteria of 'disturbance of the balance of mind' as specified in the Act is much less than that required to warrant a psychiatric diagnosis. Instead, Silverman and Kennedy[35] suggest that the circular argument 'if they killed their kids they must be crazy' has probably led to a bias in the judicial system. It is noteworthy that an Infanticide Act does not exist in either Scotland or the United States of America.

Management and prevention

Although it has been suggested that there may be 'hundreds and possibly thousands of neonaticides' each year in Britain

the official figure is in the region of 10. If this figure is anywhere near correct, the women at risk are very unlikely to be identified before the event. Furthermore, most of the risk factors for neonaticide conspire against prevention. A shy, timid, passive, adolescent living with her parents who is concealing her pregnancy, or in a state of denial with few biological manifestations of her gravid state and the absence of any psychiatric symptoms, is unlikely to come into contact with the medical profession. The difficulty is compounded by the observation that 95% of women who commit neonaticide deliver at home and only 15% receive any antenatal care.[9]

The published work has paid scant attention to prevention, and where strategies have been proposed they have often taken no account of the above facts. For example, the suggestion that 'increased social support should be provided for young pregnant women, young parents and isolated parents'[36] reveals a lack of understanding of issues such as concealment, denial, and the fact that the perpetrator is usually a single mother who, far from being isolated, is usually living at home with her parents and family.

Goldstein[37] proposes that the place where physicians can best intervene is through the provision of effective family planning methods for these women. Studies to date have not analysed the methods of contraception used by mothers who have committed neonaticide. It is probable, however, that these methods have been suboptimal and that an improvement in both education and the provision of family planning amongst young women would be of great benefit. Resnick[2] has suggested liberalization of abortion laws as the best way to reduce neonaticide but most studies do not support this strategy, as already discussed. Green and Manohar[24] point out the importance of diagnosing pregnancy in an unmarried woman and the need to explore the impact of pregnancy on her psychosocial status; healthcare workers should be especially alert to danger to the child in cases where the mother absents herself from antenatal care. In cases where denial of the pregnancy extends into the third trimester Slayton and Soloff[38] recommend inpatient management, 'if necessary with assistance of involuntary commitment proceedings'.

INFANT HOMICIDE

The historical work makes little distinction between neonaticide and infant homicide, so risk factors for the two are implicitly suggested to be identical. Marks and Kumar[5] found that between 1982 and 1988 in England and Wales there were more male (n=129) than female (n=84) victims. The gender bias applies to deaths in the first three months with no difference after four months of age. This finding is confirmed by studies in Scotland[6] and the United States[39] and yet is opposite to what would be predicted from the historical work. Marks[3] suggests that the gender bias may be due to an increased physical vulnerability of male babies, pointing out a parallel in the higher number of deaths amongst male infants from any cause. Alternatively, parents may think that male babies are more robust and are consequently more aggressive to them. Other suggestions include the possibility that male infants interact with the environment in a different way, perhaps by being more active, assertive or vocal and are hence more likely to elicit a murderous response.

There have not been any direct studies on the association of poverty with infant homicide. Marks and Kumar[6] suggest, however, that economic factors are unlikely to be important since the rate of infant homicide in England and Wales has changed little since 1957 despite continuing economic improvements. There is likewise no evidence of there being an association between babies born with congenital abnormalities and infant homicide.

Unlike neonaticide, mothers who commit infant homicide are usually married or living with their partner.[5,6] Consistent with this finding is the observation that mothers who commit infant homicide tend to be older than those who commit neonaticide,[9] most being over 25 years old;[2] in a later study[40] the average was 34 years.

The data on race and infant homicide are inconsistent. Although some studies suggest that the incidence of child homicide and infant homicide is greater amongst the black population, others have found a higher rate amongst whites.[41] Centerwall[42] indicated that, when socioeconomic status is taken into account, there is no difference in the rate of child homicide amongst the various ethnic groups.

Psychiatric morbidity is believed to be more relevant to infant homicide than to neonaticide.[22] Psychiatric symptoms may be partially attributable to physiological changes postpartum[43]: women are at 25 times excess risk of becoming psychotic in the month following childbirth[3] and 10–15% of mothers have an episode of major depression in the year after giving birth[44]. Resnick[2] reported that 75% of parents who killed their children had psychiatric symptoms shortly before committing the act. D'Orban,[9] however, judged that only 24 of the 89 women in his study had been mentally ill, of whom 14 had a psychotic illness. In a reanalysis of these data Marks and Kumar[6] found that women who killed children less than six months old were not usually classified as mentally ill but as 'battering mothers'; however, mental illness did seem to account for most infant homicides over six months. Amongst those women in whom mental illness was implicated as the cause of their actions, infant homicide was often found to be an extension of a suicidal act (on the grounds that there would be no one left to care for the child). Occasionally the primary motive was altruistic, based on a delusional belief

that a terrible fate awaited the infant. Although psychiatric morbidity is a risk factor, most women who are mentally ill do not harm their children and many women who commit infant homicide are not mentally ill.

Another area of psychiatric morbidity not directly related to the physiological changes associated with pregnancy is substance misuse. In a study of mothers who had committed infant homicide, most reported regular use of alcohol and/or cocaine antenatally and postnatally.[45] Substance misuse has been suggested to act in two ways: first, drug-exposed newborns and infants are often described as irritable, with poor feeding and irregular sleeping patterns making them difficult to care for; secondly, substance misuse can impede people's ability to evaluate their own behaviour and is correlated with aggression.[46] A rare psychiatric disorder that can lead to infant homicide is Munchausen syndrome by proxy.[47] Its incidence is not known.

A recent article states that infant homicide is committed more frequently by mothers than by fathers.[40] The findings of Marks and Kumar[5] suggest the opposite: in their study 84 fathers compared with 68 mothers were found to be responsible. Although the Infanticide Act does not recognize mental illness amongst fathers who commit infant homicide, postnatal mental illness seems to occur in men as well as women. Harvey and McGrath[61] found that 40% of fathers whose wives had suffered from postpartum psychosis experienced a classifiable psychiatric disorder—higher than the 30% prevalence rate in the partners of general psychiatry cases.[48] The men had seldom been abusive before the offence.[7] Misinterpretation of the infant's behaviour seemed to be the primary motive in many of the cases studied.[49] Any strategy aimed at reducing the number of infant homicides therefore needs to take fathers into account.

Management and prevention

The risk factors for infant homicide offer more potential for prevention than do those for neonaticide, and the antenatal clinic and postnatal follow-up provide opportunities for identifying high-risk cases. The first line in identification is through an awareness of the risk factors for postnatal depression and psychosis, as well as risk factors and clinical signs of substance abuse. This, for example, includes the knowledge that about 40% of women with postpartum depression in a previous pregnancy can be expected to have another episode after a future delivery[50] and that women who have had both postpartum psychosis and a psychotic episode outside pregnancy will almost inevitably relapse after any subsequent pregnancy.[51]

In Britain midwives are in a strong position to identify postpartum mental illness, yet they fail to identify many cases.[52] This could be radically changed by implementation of an economical and effective screening procedure such as the 10-item Edinburgh Postnatal Depression Scale.[53]

For prevention of child abuse and neglect, home visits have met with some success.[54] Brenner and colleagues[55] have suggested extending this approach to those women at high risk of committing infant homicide. Overpeck and colleagues[19] have tentatively suggested cross-training health-care professionals to enable them to deal with domestic violence; however, as they point out, there are no data on the relation between infant abuse and infant homicide. In addition, as already discussed, men who committed infant homicide had not usually been abusive before the offence. Southall *et al*.[56] used covert videosurveillance to investigate parents who had reported apparent life-threatening events in their children and were suspected of having 'induced' the illness (i.e. Munchausen's syndrome by proxy). Abuse was detected in 33 of 39 cases, with recordings of intentional suffocation in 30. Although none of these parents had evidence of psychotic illness many had an underlying personality disorder. It is unclear how often such behaviour leads on to infant homicide (or a misdiagnosis of sudden infant death syndrome) but Southall *et al*. argue strongly for formal videosurveillance in selected cases.

CONCLUSION

In the perinatal period most women are under close medical surveillance and in theory there is scope for identifying the mothers most at risk of killing their babies. Unfortunately those most likely to commit neonaticide tend to evade the healthcare system. Important risk factors that should be picked up in the antenatal history are substance abuse and mental illness. With infant homicide, women at risk may be more amenable to detection, but the perpetrator is equally likely to be the father. The rarity of both events, coupled with the infrequent contact of perpetrators with health professionals, will continue to hamper identification of the children at greatest risk. In many cases, however, infant homicide and neonaticide probably represent the extreme end of the abuse spectrum. Detection of infants most at risk may consequently result in a more widespread reduction of fatalities.

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