

National Sudden Infant Death Register

Journal Articles - Abstracts only

Sudden unexpected infant death: infanticide or SIDS?

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Lancet. 2005 Jan 1-7; 365(9453): 3-4.

The quality and value of sudden infant death necropsy reporting in Ireland.

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BACKGROUND: Infant necropsies are important for identifying cause of death. Recently issued guidelines have recommended investigations to be performed following sudden unexpected death in infants. **AIMS:** To evaluate the quality and value of infant postmortem reporting. **METHODS:** Postmortem reports from 1994-1996 and 1998-2000 in Ireland were evaluated using the National Sudden Infant Death Register. Scoring was by a modification of the Rushton system based on the extent of the postmortem data. The finding of additional pathological information was also assessed. **RESULTS:** Of the 274 cases registered during the selection period, reports were available for 245. Overall quality of necropsy reporting was below the minimum accepted standard in 55.5%; 47% of the necropsies were performed in regional paediatric pathology centres. The quality of necropsies performed in regional centres was significantly higher than those performed elsewhere. Although 86% of the cases were defined as sudden infant death syndrome (SIDS; no cause of death found), the finding of additional pathological information was significantly related to the extent of the necropsy. There was a significant improvement in the quality of necropsies after the postmortem guidelines were issued. **CONCLUSIONS:** The overall quality of sudden unexpected infant death necropsies in Ireland is less than adequate. A minimum accepted standard of necropsy is required before a diagnosis of SIDS can be made. Although standards have improved recently, this study highlights the need to adhere to published guidelines and the importance of auditing the effect of introducing practice guidelines on clinical practice to complete the audit loop.

J Clin Pathol. 2003 Oct;56(10):753-7.

Sudden infant death syndrome--a defect in circulatory control?

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The majority of Sudden Infant Death Syndrome (SIDS) infants die during sleep and especially during the overnight sleep period. Recent evidence from SIDS cases, which occurred while on a cardiorespiratory monitor at home, has suggested that the mechanism of death involves circulatory failure, with the development of a shock like state, associated

with a progressive bradycardia in the presence of continued breathing movements. In this paper we explore the circulatory effects of sleep and in particular the down regulation of the baroreceptor reflex, associated with a reduction in vasomotor tone and a fall in central venous return, cardiac output and blood pressure. This sequence of events would be exacerbated by many of the known SIDS risk factors, namely the prone sleeping position, overheating and co-sleeping. Poor central venous return, with diminished cardiac distension could induce a progressive bradycardia as occurs in adults with neuro-cardiogenic syncope. Alternatively a reduced cardiac output could result in the rapid onset of severe hypoxia through poor lung perfusion. The effects of sleep on circulatory control deserve further study in infants.

Child Care Health Dev. 2002 Sep;28 Suppl 1:41-3.

Smoking: the major risk factor for SIDS in Irish infants.

McDonnell M, Mehanni M, McGarvey C, Oregan M, Matthews TG.

ISIDA's National Sudden Infant Death Register, Georges Hall, Temple Street Hospital, Dublin.

Ir Med J. 2002 Apr;95(4):111-3.

The current epidemiology of SIDS in Ireland.

Mehanni M, Cullen A, Kiberd B, McDonnell M, O'Regan M, Matthews T.

The National Sudden Infant Death Register, Dublin.

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.

Ir Med J. 2000 Dec;93(9):264-8.

SIDS--a defect in circulatory control.

Matthews T.

Ir Med J. 2000 Sep;93(6):164-5

Sudden infant death syndrome--are parents getting the message?

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BACKGROUND: Factors that place an infant at increased risk of sudden infant death include the prone sleep position, overheating and parental smoking, while practices such as bottle-feeding, co-sleeping and the use of pacifiers remain controversial. Major publicity campaigns have been undertaken, which have included the distribution of printed material and extensive media coverage. **AIMS:** To examine if Irish parents follow the currently recommended childcare guidelines to reduce the risk of sudden infant death and to examine factors that may have impact on their acceptance. **METHODS:** A random selection of 197 infants from the Birth Register of the Eastern Health Board. Parents were interviewed and a semi-structured survey questionnaire was completed. **RESULTS:** Forty one per cent of infants are still placed on their side to sleep, an inherently unstable position. First time parents are more likely to place their infants on their backs. Over 60% of infants are exposed to one or more adults smoking in the home despite parental knowledge of its association with sudden infant death syndrome (SIDS). Sixty eight per cent of infants are overwrapped at night and parental understanding of what constitutes overwrapping is poor. Thirteen per cent of infants regularly co-sleep with their parents and 20% of these parents smoke. Pacifier use is common. **CONCLUSION:** Future programmes should target first time parents, should provide clear information regarding appropriate infant thermal environment, and should ensure regular updating of medical personnel so that they can instruct families on best current practice. Smoking remains a significant health issue with an impact on sudden infant death.

Ir J Med Sci. 2000 Jan-Mar;169(1):40-3.

Infanticide or SIDS, double jeopardy.

Mahanni M, McDonnell M, Matthews T.

Arch Dis Child. 2000 Apr;82(4):336.

Effect of prone sleeping on circulatory control in infants.

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BACKGROUND: The mechanism of death in sudden infant death syndrome (SIDS) remains unclear. Progressive bradycardia is the pre-eminent terminal event, suggesting that circulatory failure might be a crucial factor. Vasomotor tone regulates the circulatory system by controlling blood volume distribution while maintaining venous return and blood pressure. **AIM:** To examine whether prone sleeping, the most consistently identified risk factor for SIDS, has a measurable influence on vasomotor/circulatory control. **METHODS:** 44 full term infants (mean age, 7.9 weeks) were studied during an overnight sleep. Recordings were made while the infants were horizontal and asleep in the supine and prone positions, and repeated after a head up tilt to 60 degrees, maintained for 30 minutes,

while in both sleep positions. Blood pressure, heart rate, anterior shin, and anterior abdominal wall skin temperatures were measured. RESULTS: Systolic blood pressure was lower, but peripheral skin temperature and heart rate were higher during sleep, while horizontal, in the prone rather than the supine position. After tilting, there was a greater reduction in blood pressure and a greater increase in peripheral skin temperature and heart rate when in the prone position. Anterior abdominal wall skin temperature did not vary in either sleeping positions while horizontal or tilted. CONCLUSION: Prone sleeping has a measurable effect on circulatory control, with a reduction in vasomotor tone resulting in peripheral vasodilatation, a higher peripheral skin temperature, a lower blood pressure, and a higher resting heart rate. Because vasomotor tone is crucially important in circulatory control this could be a factor in increasing the risk of SIDS.

Arch Dis Child. 2000 Mar;82(3):253-6.

Concentrations of antimony in infants dying from SIDS and infants dying from other causes.

Cullen A, Kiberd B, Devaney D, Gillan J, Kelehan P, Matthews TG, Mayne P, Murphy N, O'Regan M, Shannon W, Thornton L.

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OBJECTIVES: Raised concentrations of antimony have been found in infants dying of sudden infant death syndrome (SIDS). The presumed source of this antimony is toxic gases generated from fire retardants that are present in cot mattresses. The aim of this study was to determine the role of antimony in SIDS. DESIGN: Samples of liver, brain, serum, and urine were collected from all patients dying from SIDS and a group of aged matched control infants who had died of other causes. SETTING: Nationwide study in Ireland. SUBJECTS: 52 infants dying from SIDS and 19 control infants aged > 7 days and < 1 year. RESULTS: The median concentration of antimony in the liver and brain of infants dying of SIDS was < 1 ng/g, with no difference detected between the infants dying from SIDS and the control infants. The range of antimony in the serum of infants dying of SIDS was 0.09-0.71 microg/litre (median, 0.26). Although no difference was found between infants dying from SIDS and control infants, SIDS infants were found to have higher concentrations when compared with healthy infants in the 1st year of life, probably as a result of release of antimony into serum after death. Urine antimony concentrations in infants dying from SIDS were < 3.91 ng/mg (corrected for creatinine) and similar to values found both in control infants and healthy infants. CONCLUSION: There is no evidence to support a causal role for antimony in SIDS.

Arch Dis Child. 2000 Mar;82(3):244-7.

A national model of care service for professionals dealing with sudden infant death.

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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. The National Sudden Infant Death Register

collects information on all sudden unexpected deaths in infants and young children occurring in Ireland. In this study, a comparison was made between parent's experience of professional services in the aftermath of their child's death both before and after the implementation of a National Model of Care for professionals in 1995. In addition, a random sample of 105 professionals were surveyed about their knowledge of the Model of Care services. Results were grouped according to the parental experience of the emergency services, the hospital services, the community services and the bereavement support services offered to parents. Prior to the implementation of the Model of Care Service (MOC) (1992-1994), 14 per cent of families stated that they did not find the Gardai helpful. After the Model of Care, only 7 per cent of parents expressed such dissatisfaction. Prior to the MOC, only 3 per cent of Gardai provided families with an information booklet on sudden infant death but afterwards, 23 per cent of Gardai did so. After the MOC families were more likely to have been given the opportunity to hold their infant, were given more privacy and were offered more keepsakes of their infant. Only 46 per cent of families were offered mementos of their baby prior to the MOC as compared to 84 per cent after the implementation of the MOC. They were also more likely to perceive the ancillary services such as the Gardai in a more positive light, where 22 per cent of Gardai offered the family the ISIDA support booklet compared to a previous 3 per cent. Over 50 per cent of parents were provided with a special room in the hospital following the MOC as opposed to a previous 48 per cent. Twenty-one per cent of parents prior to the MOC described the conditions in the hospital as awful, poor or fair, however 31 per cent of parents stated this after the MOC. While there have been improvements in certain areas, there still remains considerable variation in the quality of service provided to all parents. Specifically, we need to address the fact that 16 per cent of parents still report a difficulty in obtaining post-mortem information. Almost 40 per cent said they had little input into how their child was dressed or laid out at this highly emotive time. Over one-third of parents stated they were concerned about how few of their primary health providers, namely general practitioners and public health nurses called to visit them in the aftermath of this tragic event.

Ir J Med Sci. 1999 Oct-Dec;168(4):237-41.

Antimony in blood and urine of infants.

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AIM: To establish a reference range for antimony in the serum and urine of infants in the first year of life. METHODS: 100 infants were selected randomly from the population. Each infant had a single blood and urine sample taken. Antimony was assayed using inductively coupled plasma mass spectrometry. RESULTS: The reference range for antimony in the serum of infants in the first year of life was established as 0.09-0.25 microgram/l. The upper 95% centile for urinary antimony, corrected for creatinine, in the same population was 2.6 ng/mg creatinine. There was a very weak correlation between the serum and urine concentrations. CONCLUSIONS: This study confirms the presence of low concentrations of antimony in the serum and urine of healthy infants.

J Clin Pathol. 1998 Mar;51(3):238-40.

Neurocardiogenic syncope: a model for SIDS.

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A 5 1/2 month old male infant who had suffered three acute life threatening episodes was

admitted for overnight sleep studies but was found dead after their completion while still in hospital. A necropsy classified the cause of death as sudden infant death syndrome (SIDS). The sleep studies had shown no periods of apnoea (> 20 seconds) or bradycardia (< 90 beats/min), and a rapid response to nasal occlusion (5 seconds). However, autonomic function during sleep was poor, with reduced heart rate variability (6 beats/min v control 24 beats/min, SD 6.2) and postural hypotension (a 12-14% fall in resting systolic blood pressure) associated with a fall in heart rate when tilted to a vertical position. Postural hypotension with bradycardia occurs in adults with unexplained syncopal episodes and is called a neurocardiac reflex. It involves poor vasomotor tone with peripheral pooling of blood, a consequent reduction in central venous return and cardiac distension, and in some individuals a neurally mediated bradycardia, as seen in this infant, rather than the expected tachycardia. A progressive bradycardia is the predominant mechanism of death seen in SIDS infants dying on cardiorespiratory monitors at home. This case suggests that a neurocardiac reflex occurs in infants, may have been involved in this infant's death, and deserves further study in the context of SIDS.

Arch Dis Child. 1998 May;78(5):481-3.

Immunization and cot death.

Matthews T.

Ir Med J. 1998 Jan-Feb;91(1):17.

Sleep position and SIDS in Irish infants.

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A retrospective case-controlled study has compared the frequency of different sleeping positions in a group of 97 SIDS infants and a group of 98 control infants. The results show a clear excess of SIDS deaths among Irish infants sleeping in the prone (lying on abdomen) position with the risk of a SIDS increased 2.3 fold comparing prone to side and 10.5 fold comparing prone to back positions. Among the SIDS group 79% of infants were lying prone when found dead compared to 25% of the control group (chi square = 64.3, $p < 0.001$) with only 7% and 9% sleeping on their sides and backs respectively (control group 48% and 27% respectively). Irish parents should be advised to avoid placing infants in the prone position (on abdomen) to sleep as this position is associated with a significantly increased risk of the Sudden Infant Death Syndrome.

Ir Med J. 1994 Mar-Apr;87(2):58.

Autonomic function and SIDS.

White M, Beckett M, O'Regan M, Matthews T.

Rotunda Hospital, Dublin, Ireland.

Acta Paediatr Suppl. 1993 Jun;82 Suppl 389:105-6.

The autonomic nervous system--a role in sudden infant death syndrome.

Matthews TG.

Rotunda Hospital, Dublin, Republic of Ireland.

Arch Dis Child. 1992 May; 67(5): 654-6. Review.

Contemporary risk factors for sudden infant death in an Irish population--a case control study.

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This case-controlled study examines some recently implicated risk factors for Sudden Infant Death Syndrome (S.I.D.S.) in Irish infants. Irish S.I.D.S. infants are lighter at birth than controls (3463g) compared to (3542g) and boys out-number girls by a ratio of 1.3:1. S.I.D.S. infants are more frequently: breast-fed (42% vs 25%) and sleep in a location other than the parent's bedroom (54% vs 21%), but start solids at a similar age and appear not to be sicker prior to death than the control group. This study highlights the frequency of symptoms of possible ill-health (i.e. snuffles and being "chesty") in well infants during the first months of life with 32% of the control group having snuffles and 35% described as "chesty". In addition these symptoms are frequently treated with antibiotics with 31% of the control group having already received antibiotics by 2 months of age. A majority of S.I.D.S. infants were described as cold when found (52%) with 39% described as warm and 15% as sweaty. Obviously the recently implicated role of overheating may be relevant in the latter 15% of S.I.D.S. cases. In this series, 88% of infants had died by 6 months of age. Of the 97 parents of S.I.D.S. infants questioned, 78 had subsequently become pregnant by the time the study was conducted at an average time of 5 months post the S.I.D.S. event.

Ir J Med Sci. 1992 May;161(5):131-4.

Arousal responses in babies at risk of sudden infant death syndrome at different postnatal ages.

Dunne KP, Fox GP, O'Regan M, Matthews TG.

General Hospital, Castlebar, Co. Mayo.

Hypercarbic and hypoxic arousal responses during sleep were measured in healthy term infants, infants where a previous sibling died from sudden infant death syndrome (SIDS) and infants suffering a clearly defined apparent life threatening event (ALTE) requiring vigorous or mouth to mouth resuscitation. Groups of infants were tested at approximately one, six and 13 weeks postnatally. Arousal was defined as gross body movement with eyes opening and moving or crying. Hypercarbic arousal was by step increases in F1 Co2 until arousal occurred or until endtidal (PETCO2) reached 8.7 KpA (65 mm Hg) Hypoxic arousal was by step decreases in FIO2 until arousal occurred or until an FIO2 of 0.15 had been

maintained for 20 minutes. There was no difference in hypercarbic arousal threshold with age in any group. Hypercarbic arousal threshold was significantly higher in siblings (mean 53.4, 53.6, 54.7 mmHg. [7.12, 7.14, 7.29 KPA] at 0, 6, 13 postnatal weeks) compared to controls (mean 50.9, 52.3, 53.0mm Hg. [6.78, 6.97, 7.29 KPS respectively). ALTE infants differed only at 12 weeks having a significantly lower threshold (51.0mmHg. [6.80 KPA] V 53.0mm Hg. (7.06 KPA]) compared to controls. There was no difference in hypoxic arousal response with age in any group. An arousal response to hypoxia occurred in only 22% of ALTE infants and 40% of siblings compared to 67% of normal infants. Deficient sleep arousal, especially to hypoxia, is common in infants and especially those considered at increased risk from SIDS. This deficiency is present in the first postnatal week and did not vary over the first three months of postnatal life.

Ir Med J. 1992 Mar;85(1):19-22.

Autonomic dysfunction at different ambient temperatures in infants at risk of sudden infant death syndrome.

Fox GP, Matthews TG.

Department of Paediatrics, Rotunda Hospital, Dublin 1, Republic of Ireland.

Autonomic function was assessed by measuring the heart rate and blood pressure responses to a change from the horizontal to upright posture at various ambient temperatures in four groups of infants aged 8-12 weeks: 30 infants who had suffered a well-defined unexplained apparent life-threatening event (ALTE); 8 infants who had suffered a cyanotic attack; 24 healthy infants with a sibling who had died from sudden infant death syndrome (SIDS); and 17 healthy infants. Autonomic dysfunction was uncommon in the control group; no infant showed an abnormal heart rate response to postural change (R to R interval maximum/minimum ratio less than 1.0) and a postural fall in blood pressure of greater than 10% occurred in only 1 infant. In contrast, in the ALTE group 9 of 26, 9 of 30, and 4 of 22 infants showed an abnormal heart rate response and 20 of 26, 14 of 30, and 10 of 22 a greater than 10% fall in blood pressure on postural change at 20 degrees C, 25 degrees C, and 30 degrees C, respectively. 1 ALTE infant died of SIDS 14 h after showing an RR max/min ratio of 0.8 and a postural fall in blood pressure of 11% and 14% at 20 degrees C and 30 degrees C. Autonomic function testing should become part of the clinical evaluation of infants at high risk of a sudden unexpected death.

Lancet. 1989 Nov 4;2(8671):1065-7.

Lung immunoglobulins in the sudden infant death syndrome.

Matthews TG, Fox GP.

BMJ. 1989 Feb 25;298(6672):522.

Hypothermia and sudden infant death syndrome.

Dunne KP, Matthews TG.

Department of Paediatrics, Rotunda Hospital, Dublin, Ireland.

We recently reported an association between recurrent episodes of severe apnoea requiring vigorous resuscitation for which no cause could be found and episodic hypothermia. Two similar cases are now reported that give further evidence of a link between hypothermia and acute life threatening episodes of apnoea.

Arch Dis Child. 1988 Apr;63(4):438-40.

Home monitors and S.I.D.S.--practical problems.

Dunne K, Matthews T, O'Regan M.

Ir Med J. 1987 Oct;80(10):288-9.

Near-miss sudden infant death syndrome: clinical findings and management.

Dunne K, Matthews T.

The clinical findings for 73 infants with near-miss sudden infant death syndrome (SIDS) diagnosed from 1980 to 1984 are presented. Infants who were found apparently dead and who required vigorous stimulation or mouth-to-mouth resuscitation to revive them were said to have near-miss SIDS. The most common finding was apnea, often with pallor. A repeat episode requiring resuscitation occurred in 30 (41%) infants. Six (8%) had multiple episodes requiring resuscitation. Two infants (3%) died. Prediction of subsequent attacks or outcome was impossible on clinical grounds. The controversy of definition, relationship to SIDS, and treatment is discussed.

Pediatrics. 1987 Jun;79(6):889-93.

The sudden infant death syndrome--a bustling ignorance!

Matthews T.

Ir Med J. 1986 Aug;79(8):206-8.

The sudden infant death syndrome and cardio-respiratory control in Irish infants.

Matthews TG, O'Brien S.

Ir Med J. 1985 Dec;78(12):347-9.

Perinatal epidemiological characteristics of the sudden infant death syndrome in an Irish population.

Matthews TG, O'Brien SJ.

Ir Med J. 1985 Sep;78(9):251-3.

Sheffield cot death risk score applied to an Irish population.

O'Brien SJ, Matthews TG.

Lancet. 1985 Mar 23;1(8430):706.

Is autonomic control a factor in some cases of sudden infant death syndrome.

Matthews TG.

Lancet. 1984 Mar 31;1(8379):744.

The sudden infant death syndrome - Rotunda 1979/80.

Martin LT, Gill P, Bannon M, Matthews TG.

Ir Med J. 1982 May;75(5):158-9.

A survey of the care received by the parents of sudden infant death victims.

Matthews TG, Redman A.

Ir Med J. 1982 May;75(5):149-51.