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Psychiatric adjustment following meningococcal disease treated on a PICU

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Abstract *Objective:* To describe the psychiatric status of child survivors of meningococcal disease and their mothers. *Design and setting:* Home interviews with 3–12 month follow-up. *Patients:* 29 children aged 2–15 years admitted to a Paediatric Intensive Care Unit (PICU) with meningococcal disease. *Measurements and results:* Questionnaires to assess psychiatric risk in children and parents. We found an overall risk for child psychiatric disorder in 20%. Symptoms of post-traumatic stress disorder (PTSD) were present in 62% of children, and 10% had the features of a stress disorder. In 40% of mothers there was

an increased risk for psychiatric disorder, 48% experienced clinically significant PTSD symptoms, and 29% were seeking psychological help. Maternal stress symptoms were significantly associated with severity of their child's illness. *Conclusions:* A significant proportion of children surviving meningococcal disease and their parents are likely to suffer psychological stress symptoms to a degree that warrants attention.

Keywords Children · Mothers · Meningococcal disease · Paediatric intensive care unit · Psychiatric adjustment

Introduction

Meningococcal disease is now the most common infectious disease cause of death in childhood in the United Kingdom. The case fatality rate due to meningococcal disease is improving, probably because of improvements in recognition, resuscitation and intensive care management. Larger numbers of children are therefore surviving to discharge from intensive care, and other morbidities are being increasingly recognised.

Admission to a paediatric intensive care unit (PICU) with meningococcal disease carries a high level of acute stress for families, as the disease is of sudden onset and is life-threatening. Whilst persistent physical morbidity is generally low (around 5–10%) amongst survivors, little is known about psychological sequelae. There are indications that a number of children admitted to PICUs with various medical problems experience behavioural problems at 1-year follow-up, and anecdotal comments

suggest that this may be particularly marked amongst children following meningococcal disease [1]. Negative psychological effects have also been observed in the parents of children admitted to a PICU with acute illness.

The aim of the present study was to ascertain risk for psychiatric disorder following admission to a PICU with meningococcal disease, in children and their parents, in order to determine the requirement for psychiatric intervention.

Materials and methods

This study was carried out between February 1996 and March 1997 in the PICU at St. Mary's Hospital, London. Children aged 2–16 years admitted with a diagnosis of meningococcal disease were eligible for the study. Positive culture or rapid antigen tests from blood or CSF confirmed diagnosis of meningococcal disease. In the absence of positive microbiology or of an alternative diagnosis a diagnosis was made in the presence of fever and a petechial or purpuric rash, and clinical features of shock or meningitis.

Physicians and nurses at the Unit provided considerable levels of psychological support to families during admission.

Of 33 eligible subjects 29 were entered into the study. Because there were two sibling pairs, 27 sets of parents were interviewed. Socio-demographic data and a history of the presenting illness were obtained from the parents and medical records. To assess severity of illness the Paediatric Risk of Mortality (PRISM) score was calculated [2]. The child's physical outcome was determined 3 months after admission.

The subjects were followed up 3–12 months (mean 8.9 months) after the acute admission. Semi-structured interviews were carried out in the subject's homes.

The child's psychiatric adjustment was assessed from standardised parental screening questionnaires of established validity and reliability: the Behaviour Check List for 2 to 4 year-olds (a summed score of ten or more indicates risk for emotional or behavioural problems) [3], and the Strengths and Difficulties Questionnaire [4] for children aged 4–16 (a summed score of 17 or over indicates risk for psychiatric disorder). The Impact of Event Scale [5] was used with children and/or their parents to identify symptoms of post-traumatic stress disorder (PTSD) related to the admission (a total score of 20 or more being indicative of risk for PTSD (Horowitz, personal communication), confirmed by clinical judgement at interview using diagnostic criteria of the International Classification of Diseases, 10th edn.

Psychological distress in mothers was assessed using the General Health Questionnaire 28 (a score of 4 or above being indicative of psychiatric risk) [6], and the IES [5]. For this study it proved impracticable to study father's psychiatric adjustment.

Results

The sample consisted of 14 boys and 15 girls. The mean age at admission was 5.73 ± 3.43 years (range 2.1–15.9). There were 22 children (75%) from two-parent families, and 24 (83%) were white Europeans. Nine (30%) were followed-up at 3–6 months and 20 (70%) at 6–12 months after admission. No child had a history of significant developmental delay, and none had pre-existing health problems. Most cases had a good physical outcome. Only one child was still attending physiotherapy sessions following plastic surgery and skin grafts to her legs. The length of time spent in hospital ranged from 2–49 days (mean 9.5 ± 10.17 days). Days on PICU ranged from 1 to 30 days (mean 3.38 ± 5.7) and predicted mortality calculated from the PRISM score, from 0.4%–76% (mean $13 \pm 17.85\%$). Most school or nursery attending children (16/23, 70%) had resumed normal school or nursery activity within 3 weeks of discharge, but 4 (17%) spent over 10 weeks off school.

The overall risk for psychiatric disorder in the children was 6/29 (20%). Table 1 shows that this was higher in pre-schoolers. Nearly two-thirds of children had symptoms of PTSD, and 10% fulfilled diagnostic criteria for PTSD. One of these children had the highest predicted mortality (76%) of all. The most common symptoms were nightmares and hyperarousal, with situations associated with the illness triggering vivid distressing memories.

Nearly half the mothers had high scores on the General Health Questionnaire 28, indicating psychiatric risk,

Table 1 Psychiatric risk in children and mothers, 3–12 months following admission to a paediatric intensive care unit with meningococcal disease

	<i>n</i>	%
High child psychiatric risk (<i>n</i> =29)		
Behaviour Check List (aged 2–4) (<i>n</i> =8)	3/8	37
Strengths and Difficulties Questionnaire (aged 4–16) (<i>n</i> =21)	3/21	14
Impact of Events Scale (all ages) (<i>n</i> =29)		
Post-traumatic stress symptoms	18/29	62
Post-traumatic stress disorder	3/29	10
High maternal psychiatric risk (<i>n</i> =27) ^a		
General Health Questionnaire	11/26	42
Impact of Event Scales	13/27	48
Seeking help for above	8/27	29

^a27 mothers only because there were two pairs of siblings in the sample

and Impact of Event Scale scores above the cut-off for a likely risk of PTSD; 29% were seeking professional help for their psychological difficulties. The most frequently reported stress symptoms were reminders of the event bringing back strong feelings, pictures coming into mind, intrusive thoughts about the child's illness and trouble falling asleep.

Mothers' PTSD symptom levels on the Impact of Event Scale were positively correlated with PRISM scores ($r=0.48$; $p=0.01$). They were not associated with family situation (intact or broken homes), child's age or length of follow-up, but they were correlated significantly with maternal scores on the General Health Questionnaire 28 ($r=0.52$; $p=0.006$) and with child behavioural scores on the Strengths and Difficulties Questionnaire ($r=0.52$; $p=0.01$). High maternal scores on the General Health Questionnaire 28 were not associated with illness factors.

Discussion

This study shows that most children admitted to PICU for meningococcal disease experienced stress symptoms following discharge from hospital, and that in 10% this was to a marked and significant extent. Nearly one-half their mothers had high levels of psychiatric distress, some disabling.

The overall rates of child psychiatric risk were twice those estimated from general population studies [7], but most of this increase was accounted for by the small group of pre-school children, in whom the significance of psychopathology is comparatively less well established, and this limits the significance of the finding. More specifically, most children (nearly two-thirds) had high levels of illness-related post-traumatic stress symp-

toms. In 10% this was above the questionnaire cut-off and therefore marked enough to constitute a PTSD [5]. This indicates that a small group of children develop a psychiatric adjustment disorder to the stress of meningococcal disease.

Previous surveys have identified higher levels of stress symptoms and disorders in children with acute paediatric problems, such as accidents and newly diagnosed cancer (34% to 53% with PTSD compared with 10% in our study) [8, 9]. The lower rate in our sample may be related to the longer follow-up (over 3 months compared with under 2 months in previous studies), shorter treatment time for the acute condition or fewer pre-morbid psychiatric risk factors.

In line with the high rates of maternal psychiatric risk in our study (40%) (see [10]), we also found illness-related post-traumatic stress symptoms in nearly one-half the mothers, and the latter were associated with child meningococcal illness severity scores and behaviour problems at follow-up. Attention to maternal psychiatric

health may be specially indicated in the more severe cases.

Our study is based on a comparatively small number of children using screening instruments for psychiatric disorder. It will be important to replicate the findings in a larger sample using more rigorous assessments of psychopathology through research interviews. Helpful information will be derived from the use of controls (both PICU-admitted children with less life-threatening conditions and non-PICU, hospital-admitted controls with meningococcal disease), obtaining information on fathers as well as on mothers and from a longer follow-up period.

Our results strongly suggest high levels of psychiatric consequences in mothers following their child's admission to PICU with meningococcal infection. Parents and children may benefit from anticipatory guidance and support after discharge from PICU. More information is needed about risk factors to help focus psychological interventions.

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