Australian Paediatric Surveillance Unit

PROTOCOL – SEVERE COMBINED IMMUNODEIFICIENCY SYNDROME (SCID)

Objectives: To determine: i) the incidence of SCID in Australia; ii) the age and duration of symptoms at diagnosis; iii) the proportion of babies referred for and receiving bone marrow transplantation; iv) the long term survival of SCID with and without bone marrow transplantation; v) and to estimate how frequently children with X-linked SCID remain undiagnosed.

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Summary Protocol:

SCID is a rare clinical syndrome encompassing the most serious forms of primary immunodeficiency. T & B lymphocyte function is defective from birth and persistent severe infection lead to death usually before the age of one year. Inheritance is X-lined in 50% or autosomal recessive. The latter group include patients with adenosine deaminase (ADA) deficiency, whose parents usually show reduced ADA. Non-random X-chromosome inactivation occurs in lymphocytes of female carriers of X-linked SCID. The significance of family history is often not appreciated and may delay diagnosis.

The only study of SCID incidence in Australia was conducted over ten years ago and suggested an incidence of 1:66,000. The incidence in Europe appears higher (1:25,000 – 1:35,000), suggesting this condition may be under diagnosed in Australia.

Children usually present in the first 12 months of life after a period of apparent good health. Some present with superficial candidiasis, diarrhoea with failure to thrive or a chronic bronchiolotic illness. Others develop rapidly progressive interstitial pneumonitis due to pneumocystis carinii or cytomegalovirus infection. A smaller group present with an eczematous skin rash, lymphadenopathy and hepatosplenomegaly. Very rarely infants present in the first few days of life with anaemia, thrombocytopenia or lymphopenia due to failure of marrow function. Some children are only recognised when post-mortem reveals severely hypoplastic, dysplastic lymph nodes and thymus.

Affected children have an absolute lymphocyte count more than two standard deviations below the mean for age and immunoglobulin levels are usually low. B & T lymphocyte function is absent. In those not suitable for enzyme replacement therapy, treatment by bone marrow transplantation offers the only hope for survival and shows excellent results. Delayed diagnosis seriously lessens the chance of successful bone marrow transplantation.

Case Definition:

1. **Any infant with absent T & B lymphocyte function characterised by one or more of the following:**
   - **i) Low numbers of circulating C3, CD4, and CD8 positive lymphocytes**
   - ii) **Markedly reduced lymphocyte proliferation following mitogen stimulation**
   - iii) **Absent or negligible levels of IgA and IgM**

   OR

2. **Any infant dying from infection who at post mortem has the characteristic features of SCID. (severely hypoplastic, dysplastic lymph nodes and thymus).**

Reporting Instructions:

Please report any infant diagnosed with SCID since January, 1995 whom you have seen this month and have not previously reported.