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Annotations

Immunisation for the immunosuppressed child

In this day and age any death from measles is bad enough but when it happens to a child in remission and potentially cured of a lethal disease like leukaemia it is a particularly tragic and unnecessary loss. Most children should have been immunised by the time leukaemia develops so that each of these preventable deaths, and there are quite a number of them each year, can be viewed as a shameful indictment of our failure to implement an effective programme of immunisation. Our poor record has been the subject of considerable analysis and comment and, sadly, it seems that doctors and nurses must take a major part of the blame.[1–4] All too often immunisation is refused because of apathy about the disease, from ignorance about the vaccine, from misinterpretation of the few genuine contraindications or, from the invention or propagation of contraindication 'myths'. Unfortunately, a sense of responsibility to ensure that a child is protected against a potentially serious disease may too easily be subordinated to exaggerated fears about the possible medicolegal consequences of a vaccine reaction.

Recent reports about measles in immunosuppressed children document this serious problem and are timely reminders of the uncertainty that exists about the appropriate programme of immunisation for these children.[5 6] Doctors attempting to give clear guidance to parents are faced with conflicting advice from experts and a noticeable lack of relevant data. Nevertheless, based on common sense and accumulated experience especially from the United States, a few positive statements are possible:

● Measles vaccine and other *live* virus vaccines such as mumps, rubella, and oral poliomyelitis vaccine must not be administered to patients who are immunodeficient or immunosuppressed. Included in this prohibition are children suffering from congenital immunodeficiency disease and children suffering from malignant conditions such as leukaemia, lymphoma, Hodgkin's disease, or other tumours of the reticuloendothelial system and children receiving chemotherapy, high dose corticosteroids, or other immunosuppressive treatment, including radiation.

● Killed inactivated vaccines (diphtheria, tetanus, pertussis, and inactivated polio vaccine) are safe for immunosuppressed children and the immune response, though less than in normal children, will confer some protection. The usual primary course of three injections of triple vaccine (adsorbed diphtheria vaccine, tetanus and pertussis) should be given along with inactivated polio vaccine at the appropriate times if no other contraindications exist. It is particularly important that immunosuppressed children are given inactivated polio vaccine for foreign travel, and for some countries typhoid and hepatitis B vaccines (both inactivated) should also be considered. Children with congenital deficiencies of immune function may be incapable of responding to vaccines and should receive regular doses of immunoglobulin, usually once a month.

● Experts disagree on the length of time that should elapse between withdrawal of immunosuppressive treatment and the administration of live vaccines. Periods between three months and two years have been quoted. It is probably safe to use live vaccines six months after treatment has stopped as this allows a reasonable margin for the return of immune responsiveness. Nevertheless some prefer to wait for at least a year and in individual cases the child's haematologist or oncologist should be consulted before any decision on immunisation.

● Children with diseases not associated with an impaired immune system may become immunocompromised from steroid therapy. These children should be considered individually according to the dose, route of administration, and duration of treatment. If treatment is with inhaled steroids or with low to moderate doses of short acting systemic steroids either daily for short periods (under two weeks) or on alternate days for longer periods, they can receive live virus vaccines as can children being treated with topical steroids. Children receiving large amounts of systemic steroids (2 mg/kg) for periods longer than one week should not be given live virus vaccines until at least three months after treatment has stopped.

● The effect on immunity of a superimposed malignant condition and its treatment is poorly understood. Children who have had measles or have been immunised seem to remain relatively immune during treatment for leukaemia but the duration of this immunity is uncertain. We need more data on the persistence of immunity to determine if these children should be reimmunised at a later date.

● Immunodeficient or immunosuppressed children in contact with infectious disease should be given the appropriate prophylactic immunoglobulin as soon as possible. Human normal immunoglobulin and specific immunoglobulins—for example, varicella zoster immunoglobulin—are available. A preparation of concentrated human measles immunoglobulin is available in Scotland. Children who develop chickenpox should be treated with acyclovir.

● At the time of first diagnosis of leukaemia or other forms of childhood cancer, a good immunisation history is essential. Serological evidence of immunity, or lack of it, to measles, mumps, rubella, and chickenpox should be documented. If there is any doubt either from the history or serology, the child should be considered as non-immune and protected accordingly.

● Parents should be encouraged to make sure that the child's siblings are appropriately immunised. Although recipients of measles vaccine are not normally infectious to others, some experts consider it prudent to restrict contact with the *immunosuppressed* child patient for two weeks after immunisation. Siblings who have not been immunised against polio must be given inactivated polio vaccine instead of the oral vaccine.

● Children with cancer are encouraged to lead as normal a life as possible. This includes return to school as soon as treatment allows where they will be at risk from unimmunised playmates and classmates. Doctors should seek and encourage the cooperation of other parents in achieving a high level of measles vaccine uptake within the school and neighbourhood.

● Varicella vaccine is not yet available for general use but has been used to protect vulnerable children during maintenance treatment for solid tumours. Its exact role in childhood leukaemia remains uncertain and at the present time varicella zoster immunoglobulin probably offers the best protection to varicella contacts with acyclovir being used in treatment of the developed infection.

Human immunodeficiency virus (HIV) infection and immunisation

Recent concerns about HIV infection and acquired immune deficiency syndrome (AIDS) have included attention to the problems of immunisation. Official advice inevitably lags somewhat behind practical experience in such a rapidly changing clinical scene. Recent evidence indicates that, at the time of writing (November 1987):

(1) Symptomatic HIV antibody positive children (in contrast to children known to be immunosuppressed for other reasons) may (a) be given live virus vaccines, *except* BCG, as the benefits of protection from the natural infections appear to outweigh the risk from the vaccines, especially in communities where the infections are still prevalent,[7] and (b) should receive all appropriate inactivated vaccines. Thus infants should be protected by immunisation with oral poliomyelitis vaccine and measles vaccine at the appropriate times and should receive diphtheria, tetanus, and pertussis vaccines in accordance with current recommendations. There is no evidence that immunisation accelerates the course of HIV infection.

(2) Asymptomatic HIV antibody positive children (a) should be given live vaccines according to current indications with the exception of BCG, and (b) should receive inactivated vaccines when indicated.

(3) Children whose parents or other household members are known to be immunocompromised for whatever reason should be given inactivated poliomyelitis vaccine.

(4) Unimmunised children with AIDS or other clinical manifestations of HIV infection are at serious risk from infectious diseases such as measles and varicella. If exposed to these infections they should be given passive immunisation with the appropriate immunoglobulins.

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