Investigation of perinatal death

The progressive fall in fetal and perinatal mortality in the developed world has accentuated the tragedy of this unexpected event to the family and has increased pressure on clinicians and pathologists to provide an explanation and an accurate prognosis for future pregnancies. Adequate investigation of a perinatal death often entails cooperation between obstetrician, neonatologist, pathologist, and clinical geneticist and may require a range of specific laboratory tests.¹

Several studies have evaluated perinatal necropsies in recent years and have confirmed the value of the procedure.^{2–5} A recent study in Colorado claimed that necropsy was the only means of establishing the cause of death in 26% of cases and that necropsies were the sole source of information, indicating the need for genetic counselling in 48% of deaths where this service was required. A study performed in 1980, however, showed that in Britain only 61% of stillbirths and 54% of neonatal deaths had necropsies and in only 18% of deaths was the examination performed or supervised by a perinatal pathologist.⁶

Motivation

The interdepartmental approach required for investigation of a perinatal death is prone to failure due to economic or operational stresses or sheer lack of interest by one or other of the departments involved. A recent survey carried out by a subcommittee of the Royal College of Obstetricians and Gynaecologists found a wide range in the frequency with which necropsies were requested and in the adequacy of the studies carried out at different centres throughout Britain.⁷ Where pathologists are unable to or not sufficiently interested in providing an adequate service obstetricians and paediatricians lose interest with the result that requests for necropsies decrease. The pressure for a full investigation of each perinatal death and the establishment of an adequate service in perinatal pathology must come from the clinicians who have the task of explaining the death to the parents and of formulating an appropriate strategy for the management of future pregnancies. The tools which are now available to the clinician, including cytogenetic, enzymological, and molecular methods of diagnosis and imaging techniques for the study of structure and function ensure that obstetricians, paediatricians,

and clinical geneticists are deeply concerned with establishing the nature of any disease detected in the living fetus and newborn infant. Investigation of the fetus or newborn infant who dies, with or without such studies, is merely an extension of such a process.

Role of the clinician

At a practical level the clinician, an obstetrician in the event of fetal death and paediatrician in cases of neonatal death, has the task of starting and coordinating investigations. Many obstetric and neonatal units now have a check list of procedures to be carried out. These include taking samples for haematological, microbiological, and cytogenetic tests, requesting permission for necropsy, completing the necessary request form for necropsy to provide a summary of the clinical details for the pathologist, and taking a photograph of the baby for the parents. Maternal studies which have been recommended as a routine if not performed antenatally include plasma antibody screening tests for toxoplasma, rubella, cytomegalovirus, and herpes simplex, Kleihauer test, Venereal Disease Research Laboratory test, tests for rhesus or other antibodies, tests for thyroid function, and measurement of glycosylated haemoglobin and glucose tolerance test.⁷

In cases of neonatal death the need for any tests before the necropsy has been carried out depends on the extent to which it has been possible to study the infant in life and the facilities which are available to the pathologist. When dealing with an undiagnosed hydropic neonate it is important to take cord blood for haematological and microbiological studies, to save plasma and ascitic fluid for possible further studies, and even to set up a fibroblast culture for cytogenetic or metabolic studies.^{1,8} If an infant dies after prolonged intensive care, all necessary clinical investigations may have been completed leaving only one or two queries to be addressed by necropsy. If there are no facilities for radiology in the pathology department the clinician needs to have x-ray pictures taken before necropsy in cases of malformations of the skeleton such as short limbed dwarfism, and in cases of non-immunological hydrops. If there is a clinical geneticist available, he or she can provide a valuable coordinating link in these activities.

Role of the pathologist

The primary role of the pathologist is to supplement the observations of the clinician by carrying out external examination, measurement, dissection, and histological examination, as well as any additional studies that are indicated during the procedure.⁹⁻¹² It is therefore essential that the pathologist, particularly if he is a trainee or non-specialist pathologist, should be given full clinical information and encouragement by the clinicians. The high proportion of useful necropsies reported by the Denver group may be in part attributable to discussions beforehand between the trainee pathologist and the clinical geneticist in all cases.⁵ A close clinicopathological link of some kind is particularly important at a time when the adult necropsy rate is declining and there is a shift in emphasis in pathological training away from the gross observational skills needed in the postmortem room. The ability to recognise minor macroscopic deviations from normal is necessary if appropriate further laboratory investigations are to be selected in cases of infection, obscure malformation, or metabolic disease; photography and the eyes of other clinicians are invaluable aids. A paediatric or perinatal pathologist may have less need of such help from his or her clinical colleagues but is equally dependent on having a full clinical history. The pathologist needs to provide interim and final reports promptly to the clinicians and to keep them informed of the progress of any special investigations so that the findings can be explained to the parents.

Investigations in the absence of consent for necropsy

Lack of consent for necropsy does not totally preclude performance of diagnostic tests in cases where the cause of death is not known. Here again the prime mover must be the clinician as the pathologist will not normally have information about such cases. There is seldom objection to

examination of cord blood specimens or performance of maternal studies as mentioned above. It would also usually be permissible to weigh the infant and make careful external measurements, take whole body photographs and x-ray pictures, or investigate internal organs by ultrasound scans (for example to confirm renal agenesis), to culture swabs of external orifices, and to examine the placenta both macroscopically and histologically. Sadly the diagnostic opportunities afforded by this range of studies are often missed by lack of clinical forethought.

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