

Needed: Fetal Tissue Research

The US House of Representatives has recognised the value of studies of the transplantation of human fetal tissue. Research physicians and patients' advocates hope the US Senate will also see the light.

Experimental surgery shows that the transplantation of cells from a human fetus into the brain of an adult suffering from the tremors and rigor of Parkinson's disease can bring substantial relief to some patients whose symptoms prior to surgery included an inability to speak or move.

Promising data from Parkinson's patients, from diabetics who have received fetal islet cell transplants, and from an apparent recent success in Hurler's syndrome have renewed political lobbying by patients' groups and research organizations for a law that would overturn a four-year moratorium on federally sponsored fetal tissue transplantation studies (see *Nature*, **355**, 189; 1992).

First the Reagan and now the Bush Administration argued with unerring logic that to permit medical experimentation with fetal tissue is to encourage women to conceive and abort in order to provide suitable human material for research. It speaks well of women (and men) that even a special commission on the subject, appointed when Ronald Reagan was in the White House and George Bush was second in command, found no evidence whatsoever to support the reasoning that allegedly stands behind the moratorium.

However, actions reveal that the real reason for the moratorium was (and is) staunch opposition to abortion at any time, for any reason. This is apparent from the Reagan-Bush Administration's response to the advice it got. Despite a resounding recommendation in 1988 that the moratorium (unique in its ban on medical research for ideological reasons) be lifted, the White House simply ignored the advice of the committee which included Dr Bernadine Healy, now director of the US National Institutes of Health (NIH).

Legislation to overturn the moratorium recently passed by a majority of 274-144 in the US House of Representatives and now awaits action in the US Senate. But a presidential veto is likely to stand in the way of research even if Congress does vote in favour of the bill.

Meanwhile, much of the research in the field is taking place outside of the United States—for instance, in Sweden where 11 Parkinson's patients have been treated, in Britain where 48 transplants have been reported (though not published in detail) and in Mexico. The human experimentation that is taking place in the United States is funded completely by private money.

Although figures on the number of fetal tissue transplants varies, estimates suggest that as many as 100 patients worldwide may have undergone experimental therapy for Parkinson's and other diseases during the past three-to-five years. No one has been cured, but positive results have reinforced past promises that fetal tissue holds a special place in medicine, if only its powers can be discerned.

Conventional wisdom held that fetal tissue engrafted in the adult brain produced sufficient dopamine to bring about some relief in Parkinson's. However, recent data, reported at the annual meeting of the Society for Neuroscience last November (but not yet published) suggest another mechanism. Eugene Redmond of Yale University School of Medicine, who with independent funds has transplanted fetal tissue into 11 Parkinson's patients, found no dopamine in fetal cells at autopsy of one patient who died of the disease.

His observation, and those from animal research, lead to speculation that the fetal transplant is somehow stimulating the adult brain to resume its own dopamine production. If this proves to be the case, research rapidly will be directed toward the isolation of growth factors in fetal tissue.

In an interesting twist to current US policy, there is no ban on fetal tissue research *in vitro* or in animals that is comparable to the one on human fetal tissue transplantation. As a result, the NIH are currently spending \$8 million a year on research in this field.

(It is worth remembering that in the early 1970s in the United States and Europe there were intense debates about the ethics of doing any research at all on fetal tissue. The current debate on fetal tissue transplantation in humans is merely an extension of a debate about ethical issues that then, as now, was driven by deeply held views on abortion.)

To date, fetal tissue transplants in patients with diabetes, like those in Parkinson's, have been promising but not definitive. Following unsuccessful experimental surgery using cells from the pancreas of adult cadavers (graft rejection being one problem and difficulty in isolating whole adult islet cells being another), fetal tissue was a logical next choice. Subsequent research has shown that with a fetal transplant, it is not necessary to isolate insulin-producing islet cells from

other pancreatic tissue and approximately 30 diabetics in the United States are living with successfully transplanted tissue that has reduced, but not eliminated, their need for exogenous insulin.

More recently, fetal tissue transplantation was in the news when Dr Robert Nathan Slotnick of the University of California at Davis grafted cells from an aborted fetus to a fetus *in utero* with Hurler's syndrome, a rare genetic disorder of sugar metabolism that is invariably fatal by the age of ten. Although the operation cannot yet be proclaimed a success, the baby has been born and, so far, appears to be well.

The case of the Hurler's baby casts light on the debate about whether it is morally acceptable to use tissue from an aborted fetus to save the life of another, just as society endorses the use of tissues and organs from the deceased to save the living. The baby was born to a Baptist couple who strongly opposed abortion and still do but who, when faced with the fact that they were about to bear their third child with Hurler's syndrome, decided in favor of the transplant. (Their two other affected children have died.) Seeking guidance in the Biblical story of God's creation of Eve from Adam's rib, the baby's father has been quoted as saying, "God formed one human being from the tissue of another. Not only does God approve of this [transplantation], he himself performed the first one."

But one does not have to go back to Adam and Eve to find moral justification for fetal tissue transplantation research. The US NIH committee that called in 1988 for the end of the moratorium based its judgment on ethical analysis from philosophy and many religions. In Britain, a committee headed by Dr John Polkinghorne offered guidelines for the ethical use of tissue from aborted fetuses in medical research (see *Nature*, **340**, 327; 1989) that include provisions for informed consent and the separation of the woman's decision to abort from a decision to authorize medical use of the fetal tissue.

The ethicists who want to strike a moral balance between the rightful needs of future patients to advances in biomedicine and the need to respect human fetuses have done their job and written not only well but thoroughly on the subject. Scientists and physicians are trying to do their jobs now. The US government should not stand in the way.

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