Commentary on de Cock Buning: Animal Welfare Problems in Xenotransplantation

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I would like to elaborate on de Cock Buning’s (1998) discussion of xenotransplantation. Although he correctly identifies many areas of concern, he also understates the human and nonhuman animal welfare problems inherent in this new technology.

Xenotransplantation poses unique and substantial risks for precipitating epidemics from zoonotics. Xenotransplantation bypasses the human skin and mucous membranes, which normally serve as effective barriers to infection from viruses and other organisms. Then, to prevent rejection, recipients must be immunocompromised, which undermines the recipient’s second main barrier to infection, the immune system. Because it is impossible to test for unknown endogenous viruses hidden in the animals’ DNA, these unknown viruses, completely benign for the host animal, may prove lethal for humans. Screening can detect known viruses in animals. The unknown viruses, however, will continue to present a risk. These viruses can undergo recombination with human DNA and create new viruses with the potential to implicate health worldwide. A body of evidence already supports the theory that HIV-1, the principal AIDS virus, is a recombination of a monkey virus with human endogenous DNA (Horowitz, 1996). Finally, viruses sometimes prove lethal because of an overreaction by the human immune system. Immuno-
compromised xenotransplant recipients may become carriers of zoonotics that would generally kill normal, healthy people.

Humans are more susceptible to nonhuman primate viruses than to viruses of other species. Yet, in March 1997, British researchers reported that pig retroviruses can infect and grow in human kidney cells in vitro (Patience, Takeuchi & Weiss, 1997).

**BURDENS AND COSTS**

Should xenotransplantation prove a viable technology, it threatens to impose a heavy burden on our health care system. Huge costs associated with the technology would include surgical expenses, extensive hospitalization for patients, and lifelong treatment with expensive antirejection drugs. The technology would also incur heavy expenses related to raising animals and testing them for zoonotics.

The prospect of major financial windfalls has spurred enthusiasm for xenotransplantation in medical and pharmaceutical circles. Yet, the ability of our society to afford xenotransplantation for all who may benefit from it remains difficult to imagine. Were the government to guarantee all citizens access to xenotransplantation, cuts would follow in housing, food, and other programs that would very likely have a much greater impact on public health than xenotransplantation. Alternatively, xenotransplantation may become available only to the wealthy few who could afford it. In that case, although the public would bear the risk of zoonotic epidemics, only a few would, potentially, benefit from the technology.

**FROM LIP SERVICE TO ACTION**

de Cock Buning (1998) expressed concerns that chemists in The Netherlands do not share biologists' "reverence for life." In the United States, many animal researchers often do little more than pay lip service to animal welfare and seem to consider the animal protection movement a nuisance at best, a threat at worst. Sociological research has demonstrated that researchers are taught not to raise ethical issues (Arluke, 1994), and there is widespread disregard for animal pain and suffering (Phillips, 1993). The hierarchy of the scientific research establishment discourages open discussion and debate of the scientific and ethical issues raised by animal experimentation (Dunayer, 1993; Gluck & Kubacki, 1991; Mukerjee, 1997; Webers, Leaning, & White, 1994). Repeatedly, those who have publicized mistreatment of animals have suffered professionally (Kaufman, 1994; Moor-Jankowski, 1995). Concerns of American animal-welfare advocates have been enhanced by official reports that give no more than token consideration to animal welfare (Committee on Xenograft Transplantation, Institute of Medicine, 1996).
Virologist Allan (1996) wrote: "Seldom, if ever, have we had as much knowledge to prevent a future epidemic. What is lacking is the wisdom to act upon that knowledge" (p. 20). Despite xenotransplantation’s obvious risks, allies from the scientific community, pharmaceutical interests, and government enthusiastically support proceeding with clinical trials. Most people would like to believe that the biomedical establishment is primarily concerned with public health. Xenotransplantation research could produce the next plague.

REFERENCES


