THIS WEEK

Blood treatment may not kill AIDS virus

Steve Connor

AIDS seems destined to become the biggest health problem in Britain this century. Nobody should believe that they will not be affected in one way or another by the disease.

These are not the words of a scaremongerer, but the considered opinion of some of Britain's leading specialists who are fighting the spread of AIDS. They voiced their fears in Newcastle-upon-Tyne last week at the largest meeting so far held in Britain to discuss the problem.

In Britain, AIDS has so far str[illegible] 287 people, and killed 14 [illegible]f them. Britain's chief medical officer, Donald Acheson, told the conference that the number of people in Britain infected by the AIDS virus, even though they may not show any symptoms of the disease, could be as high as 20 000. Another 20 000 people will become infected this year. Each one could, in theory, pass on the virus to others.

In addition to this, scientists fear that blood products used to treat the haemophiliac population may not be entirely safe, putting such people at risk of contracting AIDS. The fears rest on growing evidence that the heat treatment used to kill the virus in infected blood products is not always effective.

The discrepancy between the number of people who have diseases associated with AIDS, and the number of carriers in the population is dubbed the "AIDS iceberg". Beneath the surface lurks a far bigger problem than the more obvious manifestations of [illegible]pidemic.

C[illegible].ral to this problem is the number of apparently healthy carriers who could yet succumb to AIDS. How many of these there are remains a mystery. Scientists last week could not agree on how long it takes for the body to recognise infection and so produce antibodies against the virus. This period may vary considerably between individuals.

Chris Schwarz

Now the system faces AIDS as well as heroin

Once antibodies are produced, blood tests will pick up their presence in the blood, and so indicate whether a person has been exposed to the virus. Between infection and the making of the antibodies, however, a person could still infect others—such people would register as "antibody-negative" in a blood test for the AIDS virus. This delay in producing a positive result in a blood test could account for the allegations made last week that heat treatment of blood products to kill the AIDS virus may not always work. Peter Jones, the director of the Regional Haemophilia Centre in Newcastle-upon-Tyne, said that there are four possible instances of haemophilia patients producing antibodies to AIDS after receiving heat-treated Factor VIII, the blood-clotting agent which haemophiliacs are unable to make. Three of the cases have occurred in the US, he said.

The fourth case, which occurred in the Netherlands, is the strongest to support the idea that the AIDS virus may be able to survive heat treatment, Jones said. This particular haemophiliac, who is not in any of the other risk groups for contracting AIDS, was antibody-negative for a year after he was given heat-treated factor VIII. He was later tested again and found to be antibody positive, showing that he had come into contact with the AIDS virus. The crucial question is when?

After Jones had presented doubts about the efficacy of the heat-treatment process, virologists and immunologists questioned whether the haemophiliacs in question could not have already been infected with the AIDS virus. Richard Tedder, consultant virologist from the Middlesex Hospital in London, said that the incubation period between infection with the AIDS virus and the creation of AIDS antibodies could be longer than a year.

However, Paul Volberding, who has treated hundreds of AIDS patients at the San Francisco General Hospital, says that the incubation period was between one and two months and "less than six months in all cases".

Acheson told the conference that in 1983 "the bombshell dropped on us" as it became apparent that the AIDS virus could infect blood products. Now that all factor VIII used in Britain is heat-treated, he said, this risk has ceased. Acheson was quick to deny Jones' claim that factor VIII is unsafe. Jones was "premature" in his statement, he said.

There are two methods of cleaning factor VIII by heat treatment. The blood plasma can be freeze-dried, and then heated in this "water-free" state, or the factor VIII can be suspended in an organic solvent and heated as a "wet sludge". According to Jones, the evidence from studies on the hepatitis-B virus, which can also infect blood products, shows that the wet-sludge method is safest.

The length of time and the temperature at which the factor VIII is kept can vary among the organisations that prepare factor VIII. Britain's own Blood Products Laboratory, at Elstree in Hertfordshire, heats the protein in the dry state at 80 degrees Celsius for 72 hours. The laboratory advises medical workers that heating at 68° C for 72 hours will destroy the AIDS virus. But, it adds, "this remains to be confirmed by prospective studies". The laboratory warns that blood concentrate "cannot be assumed to be free from viral infection" even when heated at 80° C.

The Blood Products Laboratory has promised that England and Wales will be self-sufficient in all blood products by 1988—Scotland already has its own source of factor VIII. The American companies that meet Britain's present shortfall in factor VIII privately believe that Britain will never be self-sufficient in blood products. "They've been promising self-sufficiency for 10 years now," said an employee of one supplier.

About 60 per cent of the factor VIII that Britain uses is imported from the US. It comes from companies such as Alpha, Cutter Biological and Armour.

Armour heats its factor VIII in the dry state for 30 hours at 60° C—far less than Elstree recommends as safe. Cutter Biological heats the protein in the dry state, but for 72 hours at 68° C. The problem of lengthening the time and increasing the temperature is that more and more of the final product is lost.

Tedder claimed that the virus "is certainly not a sturdy beast". He said that ▸

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▸ the protein envelope that surrounds it is not strong enough to withstand trauma such as being heated at high temperatures for long hours.

The ability of the AIDS virus to survive heat treatment may be open to doubt, but the fact that the virus has already infected the haemophiliac population is not. There are about 5000 haemophiliacs in Britain, and around 2000 of them regularly use factor VIII. Blood tests on these 2000 show that 44 per cent of them have antibodies to the AIDS virus, and have therefore been infected by it.

This proportion increases to 68 per cent for children between the ages of 10 to 14. Scientists still have no idea how many haemophiliacs who are presently free of AIDS will later succumb to the disease. At present none of the 11 confirmed cases of AIDS in British haemophiliacs has occurred in children. Nevertheless, Jones said that it is only a matter of time before full-blown AIDS appears in haemophiliac children.

The problem of assessing how far the AIDS virus has infected haemophiliacs is compounded by the relatively long incubation period between being antibody positive and the victim showing signs of the fatal diseases, such as Kaposi's sarcoma, that kill the victims of AIDS. In the homosexual population this period seems to be about 12 to 18 months, according to Volberding. In haemophiliacs, and people infected through blood transfusion, however, it appears to take anything up to four years.

● As tragic as the situation is for haemophiliacs, the outlook remains bleak for homosexuals, and for drug abusers who inject their drugs. There are signs that the spread of the virus in the gay community of San Francisco is abating, Volberding said. Nevertheless, he estimates that at least half the gay men in that city—about 35 000 men—are infected with the virus.

British doctors are seriously worried about the spread of the AIDS virus in the inner cities among young drug addicts sharing infected needles. Acheson, said that the problem in Scotland "is a serious concern which is being looked into urgently".

He said that he is keeping "an open mind" on the idea of distributing clean needles in return for used ones. This is done in Amsterdam where the incidence of AIDS among drug abusers who inject their drugs appears to be very low in comparison with other European cities.

In southern Italy for instance, the virus has spread dramatically among drug abusers. A year ago about 6 per cent of drug abusers in southern Italy were antibody positive, today the proportion is about 75 per cent.

Bill Nelles, from the Standing Conference on Drug Abuse, which helps drug abusers break their habit, says that the shortage of needles in some British cities could lead to the phenomenon known in New York as the "needle pusher". Many people will see the suggestion that the health department could be a sort of official needle pusher as condoning drug abuse. Nelles says that "it is the availability of heroin on the street that creates the drug problem, not the availability of syringes".

The presence of AIDS in a high proportion of young drug abusers adds another dimension to the spread of the disease. The iceberg has suddenly become bigger, and, Tedder said, "unless we recognise the size of the iceberg then there is little we as a species can do without a vaccine". The prospect of a vaccine is a long way off. In the meantime, health education is the only way to curtail the speed of AIDS. □

British Airways finds more cracks in 747s

CRACKS in the airframe of 13 Boeing 747s were found during inspections carried out at the weekend. Six of these planes are owned by British Airways. But, John Chaplin, group director of safety services at Britain's Civil Aviation Authority (CAA), says: "I don't think it is worrying at all."

British Airways is now inspecting the airframes of all of its older 747s following the issuing of a service bulletin from Boeing and a new directive published at the weekend by the Federal Aviation Authority (FAA) in the US. The directive has been adopted by the CAA. British Airways says its inspections should be complete by March.

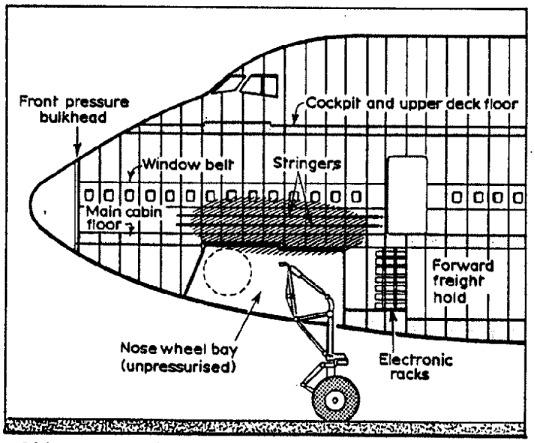
The directive from the FAA is the second to be sent out about 747s in the past three weeks. The first, issued on 31 January and adopted by the CAA, told airlines to look for cracks in the aluminium skins of 747s that have taken off and landed more than 10 000 times. Of the world's older 747s 110 have now been tested and, according to the CAA, there are no cracks in the skins.

Such cracks in the plane's main structure would cause the fuselage to depressurise and the plane to break up. This happened to the Comet 1—the first jet passenger plane—in the 1950s.

Concern about the 747s arose because of cracks found in the airframes of older planes in the Japan Airlines (JAL) fleet. Boeing requested JAL to inspect its 747s because the airline owns some of the oldest and hardest worked Jumbos in the world.

The FAA's immediate concern was that the cracks reported in the frame could propagate in the direction of the skin and cause major structural damage, hence the emergency directive of 31 January to inspect the skins.

This weekend's directive instructs airlines to inspect airframes and skins internally. The inspections will concentrate on an area around the level of the main deck in front of the door nearest to the nose and the area around the crew's emergency exit above the cockpit. Airlines can either X-ray the areas or take away the plane's inner lining—the part next to the passenger—for a visual inspection. British Airways is doing visual inspections, which will take between two and four days per aircraft.



Old 747s may be cracking up. The danger area (shown hatched on the diagram) is above the nose wheel bay. A failure to wreck control systems

Three particular parts of the airplane are being examined. These are the frame, the stringers and the fail-safe strap. The frame forms the "ribs" of the aircraft. Stringers are longitudinal pieces of metal running through the frame parallel with the cabin floor and stiffening the aluminium skin. The fail-safe strap is between the frame and the skin. It is designed to take additional load should a crack develop in the airframe.

The cracks found so far start from the area near the hole in the frame through which the stringer runs. They are a result of metal fatigue caused by the stresses suffered because of the pressure within the fuselage. The stresses are more severe near to the point where holes have been drilled to bolt the craft together or to insert the stringers. The stresses are also particularly severe in the nose. Dr John Bristow, a structural specialist from the CAA's air-worthiness division in Redhill, says that this additional stress arises because of the shape of components there, which is more complex than around the body of the plane.

Now that the cracks have been found, the effected sections of frame will be replaced. There are no plans by the CAA to ground the 747s. However, the CAA, the FAA and Boeing are now discussing long term plans for further inspections of 747s. □

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