

EXPERT COMMITTEE ON SMALLPOX

Smallpox/VI/11 ✓
7 January 1964Geneva, 14-20 January 1964THE VIRUSES OF VARIOLA MAJOR, VARIOLA MINOR AND
ATYPICAL STRAINS

by

Dr A.W. Downie, Department of Bacteriology,
University of Liverpool

In a preliminary examination of strains of virus from well-authenticated cases of variola major and variola minor, Helbert (1957) observed that strains of variola major were consistently more virulent for the chick embryo than strains of variola minor. This test was rather complicated and required inoculation of chick embryos with different doses of the two viruses. In 1961 Hizamuddin and Dumbell showed that these typical strains could be distinguished more readily by the difference in their ability to grow on the C.A.M. at 38° - 38.5° C. At this raised temperature, strains of virus from variola major produce satisfactory pocks, while strains from variola minor fail to produce lesions.

In a recent study of strains from various parts of the world, Redson, Durbell and Thomas (1963) found that 25 strains of variola major virus from India, Pakistan and Europe, behaved consistently in that all were virulent for the chick embryo and produced pocks on the C.A.M. at 38° C - 38.5° C. On the other hand, 31 strains of variola minor virus isolated from outbreaks in England, Holland and Brazil, were also consistent in behaviour and showed low virulence for the chick embryo and failed to produce lesions on the C.A.M. at a temperature of 38° C.

The examination of certain strains from Africa, however, has given somewhat irregular results and this applies particularly to strains from Tanganyika which have been studied in some detail. Of 23 strains examined, one behaved like variola major, the others were intermediate in the temperature test, between major and minor strains, and were all relatively low in virulence for the chick embryo. In this latter respect they resembled strains from variola minor. Clinical details were not available in relation to the Tanganyikan strains examined, but on the whole, the mortality of smallpox in that country appears recently to have been 10% or less. Occasional strains from other parts of Africa appear to have been intermediate in their behaviour in the laboratory.

Further work is obviously necessary in the laboratory examination of strains of virus, particularly those from Africa, and on the correlation of these findings with clinical and epidemiological information on the smallpox cases from which they were isolated.

References

- Helbert, D. (1957) Lancet, i, 1012
Nizamuddin, Md., Dumbell, K.R. (1961) Lancet i, 68
Bedson, H.S., Dumbell, K.R., Thomas, W.R.C. (1963) Lancet ii, 1085