An association between sub-arachnoid haemorrhage and influenza A infection

DAVID BOWEN JONES
M.B., B.Ch.

Department of Medicine, Welsh National School of Medicine, Heath Park, Cardiff

Summary

The sera of 25 patients with confirmed sub-arachnoid haemorrhage were assayed by complement fixation for 14 viruses. Twenty (80%) showed elevated titres to influenza A virus compared with 3 out of 25 (12%) of control subjects matched for age, sex and district and 3 out of 17 (17%) of a group of patients with other neurological disorders.

A seasonal variation in the notification of sub-arachnoid haemorrhage appeared to be related to changes in the incidence of influenza A infection.

Introduction

The present investigation was precipitated by an observation that there was seasonal variation in the number of referrals for treatment of sub-arachnoid haemorrhage (SAH) to the Department of Neurosurgery. This is contrary to the findings of Talbot (1973) but confirmed those of Takahashi *et al.* (1957), Whyllie (1962) and the Registrar General Hospital in-patient enquiry (1964).

Eight out of the 25 patients (32%) gave a history of a recent influenza-like illness and led to a virological study.

Patients and methods

Between March and July, 1978, the sera of all patients suffering from sub-arachnoid haemorrhage (SAH) who were referred to the Cardiff Neurosurgical Department were assayed by complement fixation for the following 14 viruses:

influenza A, B and C; parainfluenza IV; psittacosis/lymphogranuloma venereum; *Rickettsia burneti*; adenovirus; respiratory syncytial virus (RSV); *Mycoplasma pneumoniae*; mumps antigens V and S; herpes simplex; Epstein-Barr; cytomegalovirus; rubella.

The diagnosis of sub-arachnoid haemorrhage was confirmed by lumbar puncture but all cases of traumatic origin were excluded.

The patients with sub-arachnoid haemorrhage had

a male:female ratio of 11:14, with a peak incidence in the 40-60 age group. Aneurysms were demonstrated in 16 out of 25 patients (64%) by computerized tomographic scan and carotid and vertebral angiography. Blood samples were taken between 3 and 7 days after the episode of bleeding and again 14 days later, but because patients were routinely given dexamethasone the validity of the second titres is in doubt. The first control group was a series of 17 patients in the care of the Department of Neurology who underwent screening for various suspected CNS viral disorders.

The second control group was made up of 25 patients matched for age and sex, and living in the same area, who were referred, during the same period, by general practitioners for viral screening to the Cardiff Public Health Laboratories but had no clinical involvement of the nervous system. Viral complement fixation titres were determined in batches to reduce laboratory variation.

Results

The sera of the SAH group were initially assayed against all 14 viruses and titres > 1/16 were considered positive. Only influenza A, RSV and adenovirus showed raised titres in more than one patient.

The sera of the control groups were then assayed for these 3 viruses.

For influenza A, the differences between the SAH group and the other 2 groups were statistically highly significant ($P=0.001$).

TABLE 1. Number of patients with viral complement fixation titres > 1/16

	Influenza A	RSV	Adenovirus
SAH group	20/25 (80%)	17/25 (68%)	2/25 (8%)
Neurology control group	3/17 (17%)	2/17 (11%)	1/17 (6%)
Matched control group	3/25 (12%)	8/25 (40%)	3/25 (12%)

- HOULT, J.G. & FLEWITT, T.H. (1960) Influenzal encephalopathy and post influenzal encephalitis. *British Medical Journal*, **1**, 1847
- Registrar General Hospital In-Patient Enquiry (1964).
- STUART-HARRIS, C.H. (1965) *Influenza and Other Respiratory Infections*. Edward Arnold, London.
- TAKAHASHI, E., SASAKI, N., TAKEDA, J. & ITO, H. (1957) The geographic distribution of cerebral haemorrhage and hypertension in Japan. *Human Biology*, **29**, 139.
- TALBOT, S. (1973) Epidemiological features of subarachnoid and cerebral haemorrhages. *Postgraduate Medical Journal*, **49**, 300.
- WHYLIE, C.M. (1962) Cerebrovascular accident deaths in the United States and in England and Wales. *Journal of Chronic Diseases*, **15**, 85.