

## SUDDEN NON-TRAUMATIC DEATH ASSOCIATED WITH PHYSICAL EXERTION IN IDENTICAL TWINS

by

*Ernst Jokl and Joseph B. Wolffe*

The problem of sudden non-traumatic death associated with physical exertion differs from the wider problems of sudden death. It usually concerns physically fit persons of youthful age whose excellent exercise tolerance would have appeared to exclude the possibility of the presence of a pathological process causing an acute fatal breakdown. Sudden death associated with physical exertion is always the result of *cardiovascular* disease. The exercise may or may not in such instances be the trigger event leading to the final collapse. However, it never represents the cause of death.

The following is a summary of two observations which have a bearing upon the question as to the endogenous as against extraneous nature of the pathogenetic processes involved in such cases. The first case is of our own observation<sup>1</sup>; the second was reported by O'Brien<sup>2</sup>.

### **Hypoplasia and maldevelopment of arterial system associated with persistent thymus, hypertrophy of lymphoid tissues and renal dysplasia**

After a strenuous game a 32 year old international football player collapsed and died. The case created a sensation since the deceased had been known throughout the country as "The Iron Man of Rugby". Post mortem examination revealed general hypertrophy of the heart which weighed 482 Gm (17 oz). The hypertrophy was most apparent in the left ventricle which measured 2.7 cm in thickness. All cavities of the heart were dilated. Numerous fibrotic patches were irregularly distributed throughout the wall of the left ventricle. There was widespread *atheromatosis* more particularly in the coronary artery. The left branch of the coronary artery was markedly narrowed at three places. The aorta was extraordinarily soft and thin. The descending portion of the vessel measured little over half an inch in diameter which is less than the normal size. Excess lymphoid tissue was found in the spleen and in the thymus gland which weighed 26 gm. (normal weight 15 gm.) and which contained active Hassal's bodies. The left kidney was small (62 gm.) and was the seat of advanced *hydronephrosis*. The parenchyma was stretched and thinned and the pelvis was much dilated. The left ureter was sharply kinked

<sup>1</sup> JOKL, *Am. Heart J.*, 24. Sept. 1942.

<sup>2</sup> O' BRIEN, *Brit. M. J.* 16. May, 1942.

about 1 in. above the bladder. The right kidney was hypertrophied (330 gm.). Genital organs were small.

The deceased had an identical twin brother who a few months earlier had also died during exertion. (bathing).

### Cerebral Aneurysm

O'Brien published a report on sudden death in identical twins. The one, a previously healthy adult, age 26, while playing tennis complained of severe headache and became subsequently unconscious. He died the following morning, the diagnosis being *subarachnoid* hemorrhage. No autopsy was carried out. Soon afterwards the deceased's twin brother who had been employed on a farm pulling sugar beets was found dead in an empty house. Post-mortem examination revealed a *hemorrhagic cyst* in the middle of the right hemisphere beneath the Rolandic area about 4 cm. in diameter, with a pigmented wall. Near the origin of the left middle cerebral artery was a thrombosed *aneurysm* about 1 cm. in diameter. Adhesions and pigmentation of the surrounding tissues pointed to leakage. The brain was congested and oedematous and covered with thick pus over the base.

### Summary

Two cases of sudden non-traumatic death associated with physical exertion in identical twins. The one observation concerned a famous rugby player who died immediately after a competitive game. Autopsy revealed cardiac hypertrophy and advanced myocardial fibrosis, excess lymphoid tissue, a large thymus gland with active Hassall's bodies and hydronephrosis of the left kidney. A twin brother of the deceased died at about the same time during swimming. The second instance was studied by O'Brien. It refers to a man age 26 who died during physical work on the farm (pulling sugar beets). Post mortem examination showed a hemorrhagic cyst with a pigmented wall and a thrombosed aneurysm of the left middle cerebral artery which had leaked. An identical twin brother of this man had died a short time previously while playing tennis.