

to inflow rate. The c.s.f. absorption rate is also diminished in the dog with increased water content. These results in edematous brain might be explained by possible decrease of cerebral oxygen consumption which has been said to be in close relation to c.s.f. production rate. Histological findings in these brains are also studied and discussed.

S-B-7. Effects of Urea and Mannitol on Cerebral Edema—Experimental Observation Utilizing Polygraph

Hajime NAGAI, Kazuhiro FURUSE, Yoshihiko OKA, Yoshiaki SUZUKI,
Atsushi IKEYAMA, Shigeru MAEDA, Michiaki HASUO
and Shin HOSHIKAWA

2nd Department of Surgery, Nagoya University School of Medicine

The effects of urea and mannitol on cerebral edema were observed utilizing polygraph which had eight parametrs. consisted of respiration, systemic blood pressure, cerebral blood flow by means of heat clearance method, intracranial blood pool by means of RISA injection, EEG, cortical PO₂ and PCO₂.

Cold induced cerebral edema was prepared on one side of the hemisphere of 30 dogs. The animals were divided into the following two groups.

Group I: Seventeen dogs received intravenous infusion of 30% urea solution of 1.5 gm/kg. Immediately after the infusion, the intracranial pressure, after a slight initial elevation, decreased gradually. In all cases, irregular or rough respiration was observed within 15 minutes. During this period the systemic blood pressure decreased, and four dogs passed into shock state and died. Cortical PO₂ decreased in 13 of 14 dogs, and was always accompanied by reduction of regional cerebral blood flow and enlargement of intracranial blood pool. In EEG, slight voltage depression and occasionally slow waves were observed in early stage after the infusion, and then these alteration were followed by gradual improvements. According to the direct observation of cortical and peripheral vessels, urea dilated both vessels definitely after the infusion. These experimental results suggested that urea acted as a vasodilator and induced an unfavorable effects for the dogs in early stage of the infusion. Therefore, the administration of the urea solution remains some problems for its clinical use.

Group II: Thirteen dogs received intravenous infusion of 20% mannitol solution of 3.0 gm/kg. The systemic blood pressure increased slightly in all cases. In this group, neither irregular respiration nor the alteration of cortical PO₂ was observed. Cortical PCO₂ showed gradual decrease, and was always accompanied