CORRESPONDENCE

BRAIN TEMPERATURES IN THE RABBIT DURING ELECTRICAL ANAESTHESIA

Sir,—In the timely article by Drs. Ross and Wulfsohn on this subject (Brit. J. Anaesth., 35, 280) the authors state on page 284 that the rate of heat loss of the brain is proportional to the difference in the temperature of the tissue and the blood.

This statement is of extreme importance as it leads to the suspicion that in the event of an organism being febrile and having a temperature in the region of 40°C, the brain temperature during electrical anaesthesia might reach the critical level of 41.5°C, at which denaturation of the brain proteins can occur.

The repetition of these studies in the presence of artificially induced hyperthermia may settle this point.

HERBERT L. ERLANGER
New York

A copy of the letter received from Dr. Erlanger was forwarded to Mr. Ross and Dr. Wulfsohn who replied as follows;

Sir,—We would like to thank Dr. Erlanger for pointing out a possible limitation in the use of electrical anaesthesia. We agree that the use of electrical anaesthesia in a febrile organism will result in a rise in the temperature of the brain, possibly to harmful levels. We feel, however, that a few comments may be justified.

Dr. Erlanger stated that the temperature of 41.5°C is the critical level at which denaturation of brain proteins can occur. If he has obtained this figure from the statement in the last paragraph of our article, he has drawn a wrong conclusion. We did not state that denaturation occurs above 41.5°C but merely that other workers had found no ill-effects after repeatedly heating parts of the brain to this temperature. If, on the other hand he has direct evidence that denaturation occurs above this temperature we would appreciate receiving this information.

We would also like to expand our argument with regard to the rate of loss of heat from an organ which is being heated locally. The rate of loss of heat is dependent on at least three factors. These are the rate of transfer of heat from the areas of local heating to the blood, the rate of transfer of this extra heat to the body surface by the blood, and the rate of loss of heat from the body surface. When the body as a whole is febrile, the second and third factors clearly increase because of an increased blood supply and temperature gradient between the body and its surroundings. The first factor—the rate of transfer of heat from the heated areas to the blood—depends, as we originally stated, on the difference in temperature between the blood and the heated tissue.

It is impossible to predict the relative importance of these, and possibly other factors, and so too it is impossible to predict the result of their interplay. The answer must be found by further experiments.

F. P. ROSS
N. L. WULFSOHN
Johannesburg

REFERENCE


A copy of this letter was shown to Drs. Dundee and Love, who replied as follows:

Sir,—The use of the term “subnarcotic concentrations” was decided upon only after we had given considerable thought to the problem of selecting a term which would most accurately convey the meaning we intended. Most probably confusion is due to differing interpretations of the word “narcotic” on the two sides of the Atlantic ocean. MacNalty’s British Medical Dictionary defines it as “a drug producing a stuporous condition or sleep”, whereas the American dictionary by Dorland defines it as “a drug which at the same time relieves pain”. If the latter definition is accepted, of course, we are quite wrong. This meaning, however, was not intended.

The British dictionary defines “hypnotic” as “any drug or other remedy which has the property of inducing normal sleep or has any anodyne effect”. An anodyne, of course, is a drug which will relieve or soothe pain. Again in this context “subhypnotic” would be quite the wrong word to use.

Since anaesthesia means loss of sensation it is obviously wrong to use the word “subanaesthetic”.

JOHN W. DUNDEE
W. LOVE
Belfast