Peculiar Disorder of Plasma Thromboplastin Production

ONE of the several functions of platelets is participation in the formation of plasma thromboplastin. Recently, we encountered in the blood of a patient an agent with the unprecedented action of specifically hindering this activity. Thus, the presence of his plasma or serum in the incubation mixture inhibited the generation of plasma thromboplastin[1]. Compared with a normal control (Table 1) the derangement, as estimated from the clotting time of the substrate, was more apparent on reducing the number of platelets (experiments *B* and *C*) and practically abolished on using a concentrated suspension (experiment *D*).

Table 1. EFFECT OF PLATELET CONCENTRATION ON INHIBITOR ACTIVITY

Experiment No.	Platelet suspension (10^3/mm.^{3})	Clotting time of substrate (sec.)* Source of plasma or serum Normal	Patient†
A	600	10	14
B	300	12	19
C	150	14	25
D	1,200	8½	9

* Equal volumes of plasma treated with aluminium hydroxide (1 : 5), diluted 1 : 10 serum, platelet suspension and 0·025 *M* calcium chloride were incubated at 37° C. for 6 min. The activity of the mixture was tested by taking 0·1 ml. together with 0·1 ml. 0·025 *M* calcium chloride and adding them simultaneously to 0·1 ml. normal citrated plasma (substrate), and recording the clotting time.

† In this case the incubation mixture contained either patient's plasma and normal serum or patient's serum and normal plasma.

Antihæmophilic globulin and Christmas factor levels[2] were determined in the presence of excess platelets; normal results were obtained. The patient's platelets were fully active in the thromboplastin generation test. Pre-incubation of normal platelets with patient's plasma or serum did not cause further deterioration in the production of plasma thromboplastin, indicating that the inhibitor has a retarding but not a destructive action on the platelet thromboplastin component. Further study has shown that this inhibitor counteracts the combination of platelets with antihæmophilic globulin and Christmas factor; the activity of other blood-clotting factors or their intermediate products were uninfluenced.

F. NOUR-ELDIN*
JOHN F. WILKINSON

Department of Hæmatology,
Royal Infirmary,
Manchester 13.
Nov. 4.

* Research Fellow in Hæmophilia.

[1] Biggs, R., and Douglas, A. S., *J. Clin. Path.*, **6**, 23 (1953).
[2] Nour-Eldin, F., and Wilkinson, J. F., *J. Physiol.*, **136**, 324 (1957).

Salt Intake, Adrenocortical Function and Hypertension

A RECENT communication[1] proposed that the high levels of salt consumption current in modern societies were beneficial since the salt stimulated adrenal cortical function and thereby set in motion various adaptive mechanisms that make the individual more responsive to the stresses of modern living. Space does not permit examination of whether modern living actually has more stresses than a primitive life: one American anthropologist, Prof. G. P. Murdock of Yale University, several years ago[2] expressed strong doubts that such was the case.

Although the addition of salt to food is as old as recorded history, many vigorous groups have used none except that which occurred naturally in foodstuffs; for example, Eskimos, certain of the Chinese and North American Indians, the Lapps, and the Masai of Africa. Available data indicate that the sodium intake on these natural diets would range from about 1 to 2 gm. (2·5–5 gm. as sodium chloride) and sometimes less. Beginning with the pioneering work of Allen[3], drastic salt restriction has been used widely in the treatment of various diseases. During the past ten years I have studied some 75 patients in metabolic wards for long periods before and after sodium restriction of 40–175 mgm./day. These people have maintained sodium balance and normal activity, and evidence of impaired adrenocortical function has not been observed. One walking hospital patient has now been restricted to about 115 mgm. sodium/day for more than four years; she remains in electrolyte balance, and numerous clinical and biochemical tests of adrenocortical function, including the response to intravenous adrenocorticotrophic hormone[4], which were made recently, indicated a normally reactive adrenal cortex. In other patients, psychiatric interviews, psychometric studies and electroencephalograms before and after drastic salt limitation revealed no changes. It has been concluded that adrenocortical function is normal on a low salt diet.

Finally, is a high salt (sodium chloride) diet itself disease-producing? I believe there is ample evidence to indicate that salt is a primary cause of 'essential' hypertension which, after atherosclerosis, is the commonest form of cardiovascular disease in Western society. For some years, I have been intrigued by the apparent low incidence of hypertension among many primitive races; it was of interest to find that among such groups for which data were available, a low dietary intake of sodium was a common factor, generally 1–2 gm. per day. (All experimental and clinical evidence indicates that it is the sodium, not the chloride ion, which is toxic.) Up to the present time I have found no reports of groups which habitually consume low sodium diets and have hypertension to any significant degree.

It has been known for several years that feeding salt to rats will produce a disease which mimics human hypertension[5]. Beginning in 1954, I have published evidence indicating that individuals customarily on a high salt diet will have significantly more hypertension than those on a low salt diet[2,6]. It is known that the West Indian Negro has a much greater incidence of hypertension than the Whites in the same area[7], and according to Prof. Murdock the evidence suggests that from early childhood the Negroes eat a diet high in salted pork and fish. The Southern Negroes of the United States have several times as much hypertension as the Southern Whites[8]. My interviews with Negroes from that region indicate that for most of them salted pork in one form or another has been a prominent article in the diet from early childhood.

Prof. A. Halawani, director-general of the Research Institute of Tropical Medicine, Cairo, informed me last year that the Egyptian peasants ordinarily ate large amounts of heavily salted cheese, and when available, salted fish: he had no precise statistics, but it was his impression that hypertension was relatively common among these peasants in contrast to most Africans and Orientals[8].

It has been axiomatic that Orientals have little or no hypertension[8]. From the work of Prof. T. Fukuda,