Blood viscosity in multiple sclerosis

G. W. SCOTT BLAIR AND R. H. MATCHETT

From the Research Laboratory, Oxford Haemophilia Centre, Churchill Hospital, Oxford

SUMMARY Native blood from healthy subjects and from some pathological cases showed a fall in viscosity after the first passage through a stainless steel capillary viscometer in 97% of tests. Forty-five blood samples from 27 active multiple sclerosis patients were tested. Blood from 19 of these patients showed no fall in viscosity.

During the past three years, one of us (G.W.S.B.) has been attached, as a rheologist, to the Oxford Haemophilia Centre in order to study some of the physical properties of human blood in health and disease.

This study has now ceased, but among the observations made was one relating to patients with multiple sclerosis (MS) which other workers may care to pursue.

These observations are concerned with the physical changes which take place in native human blood as a result of shearing through a stainless steel capillary viscometer after withdrawal from the antecubital vein but before coagulation takes place. We were at a considerable disadvantage in having to use native blood, but the usual anticoagulants: heparin, citrate, oxalate, completely upset the observed phenomena. Unfortunately, it was too late to repeat the experiments by the time we had found, at the suggestion of Dr. S. G. Rainsford, that the blood could be filtered through a bed of an ion exchange resin with hardly any change of properties except greatly to delay coagulation.

There was normally found to be a marked drop in viscosity after the first passage of the blood through the viscometer. No such change has been reported previously, to our knowledge, either in normal or in MS native blood.

Apart from the study of various blood diseases, our investigations included an examination of the blood of 27 MS patients in all of whom the diagnosis had been classified as 'definite' by Professor W. Ritchie Russell.

In all, 45 samples were studied from these 27

patients and we were surprised to find virtually no drop in viscosity in 19 of them. In contrast to this, we found the fall to be clearly present in 97% of about 80 samples from normal subjects.

Regrettably, we have not had the opportunity to correlate this finding with other haematological anomalies reported in this disease and must now leave the problem to others.

Little appears to have been published on the viscosity of blood from MS patients. Proewitz (1958) has claimed that the viscosity is very high during the active phase of the disease but falls during remissions. We have found a wide range of viscosity among our MS patients; probably wider than normal, but no correlation with activity.

Several authors have shown that platelet adhesiveness is increased in MS as is also the case with a number of other pathological conditions (Sanders, Thompson, Wright, and Zilkha, 1968).

Our technique was described in detail in a paper read at a Meeting of the British Society of Rheology (Scott Blair and Matchett, 1971) but some of our conclusions would now require amendment and, with the use of the ion exchange resin, the technique can be improved. Information regarding these refinements will be supplied on request.

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