South African Medical Journal : Suid-Afrikaanse Tydskrif vir Geneeskunde

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PRACTICAL ASPECTS OF BLOOD TRANSFUSION SERVICES

The world's first civilian blood bank was established at County Cook Hospital, Chicago, USA, in 1936. Before this it was only for a limited period during the 1914-1918 War that blood had been collected in transportable containers which could be stored until required.

The organization of a transfusion service of this type was dependent on the outcome of investigations carried out in diverse fields. These investigations possibly started with Harvey's lectures (1616) on the circulation and Blundell's observation (1818) that human blood was more effective for the treatment of man than blood of animal origin. In recent times there have been the landmarks of Landsteiner (1900), who discovered the existence of different blood groups in man and demonstrated in the laboratory that blood from one person may be incompatible with that of another; of the announcement during 1914 that sodium citrate was a non-toxic substance which would prevent clotting of blood placed in containers; of Rouse and Turner (1916) who found a means of considerably enhancing the life of stored blood cells by adding dextrose and other preservative materials to control ezymatic action; and of Robertson who transported, stored and transfused blood in army casualty-clearing stations during 1916-1918.

Today, barely twenty years since the organization of the first hospital blood bank, transfusion services and blood banks have multiplied a thousand-fold throughout the world. Therapeutic transfusions have become part and parcel of most branches of medical practice. The initial impulse for this great increase in blood-transfusion activity was to be found in the Second World War. Under the stimulus of national emergency the money and research facilities required were made available and the large-scale collection of blood for anticipated civilian casualties was rendered easy by a new awareness of the importance of the blood donor.

Various factors ensured that blood banking would be a continued feature of post-war medical practice. Many medical men, during their period of military service, became familiar with the clinical and technical aspects of transfusion. More important, perhaps, was the fact that blood, deviated to ordinary civil hospitals when war-time casualties did not amount to the expected figure, was readily available and was used in rapidly increasing amounts, so that for the first time the advantages of transfusion were clearly demonstrated.

The development of new surgical operations, such as those on the heart, which are entirely dependent on the supply of enough safe blood, and the increasing use of irradiation therapy supported by blood transfusion, have helped to increase the demand for blood.

The increasing activity and the continued advance in blood-group study, which is taking place today, is bringing with it a considerable body of knowledge, not all of which deals with the understanding and treatment of disease. The fields of genetics and anthropology, and of fundamental serology and immunology have been invaded and have gained much from the work of those who study blood groups. It is not surprising, therefore, that the average practitioner, and even many a pathologist, is bewildered by this rapidly expanding and generously documented speciality —even if he does make the effort to break through the barrier of the transfusionist's tribalistic language and cult of symbols!

The fact remains that the average medical practitioner (and this applies in full measure to South Africa), whether he is engaged in general or in specialist practice, in the city or in the country, will sooner or later, of necessity, if he has his patients' welfare at heart, have recourse to the transfusion of blood. It is as well, then, to realize that this procedure is associated with very definite legal responsibilities which can be adequately discharged only in the light of knowledge and understanding of certain basic facts.

As stated by Gordon, Turner and Price[1] 'Patients who have received incompatible transfusions may develop an acute haemolytic reaction and death may ensue. The patient may, however, recover from the immediate effects of the haemolytic reaction and may develop a lower nephron nephrosis with subsequent death from uraemia.

'A Rh negative mother, who has developed anti-Rh agglutinins during pregnancy, may suffer a serious haemolytic reaction should she be the recipient of a Rh positive blood transfusion. Similarly, should anti-Rh agglutinins have developed in the maternal blood prior to pregnancy, these antibodies may react with the foetal cells and will therefore adversely affect pregnancy.

'Medical Officers responsible for blood transfusions should be aware that negligence in carrying out the grouping tests may involve them in culpable homicide charges.'

Compatibility tests or cross-matching are designed to prevent the transfusion of incompatible blood, and it may well be decided that a medical practitioner, who transfuses blood without previously performing such a test, or fails to have such a test carried out on his behalf by a reputable laboratory, has not taken reasonable precautions to safeguard the patient and is, therefore, guilty of culpable negligence.

Cross-matching tests may be elaborate affairs. In a patient who has immune antibodies, possibly a result of previous transfusions, it may be a procedure lasting two or three hours and employing very special reagents such as digestive enzymes, specially prepared animal sera, and purified protein fractions. When time and circumstances allow the performance of such elaborate tests, blood transfusion becomes virtually a perfectly safe procedure, although, as Discombe[2] points out in his monograph, which should have a place in every hospital side-room, we have not quite reached the stage where the legal phrase *res ipsa loquitor*, 'the thing

speaks for itself', is accepted by the courts. If it were so accepted as applying to blood transfusion, then any harmful consequence following upon the transfusion of blood would in itself be such strong evidence of negligence that the onus would fall on the giver of the transfusion to demonstrate that he was not negligent, while the prosecutor or the plaintiff, to succeed in a legal action, need not bring any evidence other than that the harm followed upon the transfusion.

The problem of safety in connection with transfusion and cross-matching tests arises from the fact that many patients need the blood quickly. This is particularly the case with the great majority of transfusions given in country areas, where, moreover, skilled laboratory assistance is often not available. It is under these awkward circumstances that more simple compatibility tests must be used, the type of test being determined on clinical considerations such as the degree of urgency and a history of previous transfusions or maternal immunization.

Although the exercise of reasonable care is to some extent dependent upon such factors as the amount of time which can be devoted to pre-transfusion tests, the range of blood available, laboratory equipment, reagents, and available assistance, knowledge and insight into the technical and serological aspects of blood grouping remain the first requirements for the practitioner who prescribes blood for his patient.

It is indeed fortunate that a knowledge of some very simple facts will suffice for the technical requirements of a very large proportion of all blood transfusions. The same basic knowledge will also serve to distinguish the small proportion of cases which require more elaborate technical tests. It is therefore possible for the giver of transfusions to avail himself, with a relatively small effort, of that practical knowledge of blood groups and blood transfusion which will place within his reach the ability to exercise reasonable care in the selection and administration of blood.

It is with these considerations in mind that one welcomes the publication of the revised edition of the Medical Research Council Memorandum No. 36 *The Determination of the ABO and Rh (D) Blood Groups for Transfusion* which receives favourable review elsewhere in the *Journal*.[2]

1. Gordon, I., Turner, R. and Price, T. W. (1953): *Medical Jurisprudence*. London and Edinburgh: E. & S. Livingstone Ltd.
2. Discombe, G. (1955): *A Guide to the Practice of Transfusion within Hospitals*. London: William Heinemann Ltd.
3. Book Reviews (1959): S. Afr. Med. J., 33, 187.

ASPEKTE VAN OORGEWIG

Die probleem van oorgewig bly helaas nog steeds met ons as 'n moeilike probleem om te hanteer. Baie pasiënte het, meer as vroeër, bewus geword van die moontlike verband tussen lewensverwagting en oorgewig, en meer bepaald van die moontlike verband tussen sekere soorte hartsiekte en oorgewig. Die feit dus dat hartsiekte gedurende die laaste aantal jare so 'n belangrike oorsaak van sterfte geword het, neig om die belangrikheid van oorgewig as ‚toestand' ook te laat toeneem.

Wat die veroorsaking van oorgewig betref, is daar natuurlik twee groot faktore wat in aanmerking geneem moet word: Eerstens is daar die faktor van die hoeveelheid voedsel (kalorieë) wat verorber word, en tweedens is daar die faktor van wat die liggaam met daardie voedsel maak.

Wat die laasgenoemde punt betref—die kwessie van metabolisme—sou 'n mens kon sê dat dit wel aangeneem word dat daar belangrike konstitusionele verskille bestaan tussen mense en dat daar wat betref vertering, absorbering en utilisering van voedsel groter reste en meer vermorsing by sommige persone voorkom as by ander. Dieselfde skaalgewig van voedsel sal dus nie noodwendig dieselfde toename in liggaamsgewig by twee persone veroorsaak nie.

Wat die eersgenoemde punt betref—die hoeveelheid voedsel gebruik—bly dit in die algemeen tog waar dat oorgewig die resultaat is van die neem van oortollige voedsel. Dit is dus belangrik om te weet waarom sommige mense meer eet as ander mense.

Eerstens sou ons kan sê dat daar hier ook konstitusionele faktore aan die werk is. Sommige mense is altyd honger en kan ter eniger tyd 'n groot aptyt opwerk deur net aan kos te dink. Verder dra maatskaplike gewoontes en lewensmilieu by tot die hoeveelheid wat mense eet. Gewoontes soos die drink van alkohol en rook beïnvloed aptyt. En laastens is daar interessante sielkundige persoonlikheidverskille wat in aanmerking geneem moet word.

Suczek[1] se studie oor sielkundige aspekte van gewigsverlies by vrouens het dit byvoorbeeld aan die lig gebring dat daar 'n neiging is by vet vrouens om oorheersende persoonlikhede te hê. Hierdie vrouens se houdings oor hulself toon byvoorbeeld belangrike beklemtoning van ‚sielkundige' krag, hipernormaliteit, narcissistiese trots en 'n ontkenning van swakheid. Hierdie persone vorm die direkte teenvoeters van die geïnhibeerde, teruggetrokke soort persoon wat aan chroniese onsekerheid en spanningstoestande ly en wat sleg slaap en nog slegter eet. Dikwels, alhoewel nie altyd nie, is dit die latente of duidelike wellusteling wie se persoonlikheid gekenmerk word deur neigings tot oorheersing.

Al hierdie oorwegings is belangrik by die behandeling van die probleem van oorgewig en ons wil dit hier duidelik stel dat 'n nuwe benadering tot hierdie probleem nodig is. Verslankingsdiëte en mediese middels wat eetlus onderdruk is nie genoeg nie. Ons moet die hele mens met sy konstitusionele aanleg, sy gewoontes en sy persoonlikheid in aanmerking neem. As algemene beginsels by die behandeling van oorgewig, sou ons dus die volgende kon neerlê:

1. Onthou dat daar wye variasie is van wat fisiologies normaal is.

2. Moenie 'n fetisj van oorgewig maak nie. Dikwels is 'n mens se weldadige voorkoms 'n aangename faset van sy persoonlikheid. Help hom om dit as sodanig te aanvaar met insig, liewers as om hom in 'n suurknol te verander.

3. As die probleem van oorgewig aan die morbiede en abnormale grens, moet verslankingsdiëte en mediese middels wat die eetlus onderdruk wel voorgeskryf word; maar daar moet ook onthou word dat hierdie benadering alleen nie genoeg is nie. Verslankingsdiëte en medisyne sal min vermag as ons nie ook rekening hou met die basiese persoonlikheidseienskappe van die man van baie ponde (gewig) nie.

1. Suczek, R. F. (1957): Amer. J. Clin. Nutr., 5, 197.