

Recent Therapeutic Advances in the Control of Haemorrhage

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THE clinician is frequently faced with the problem of controlling haemorrhage which, if ineffectively dealt with, may lead to fatal or debilitating sequellae. In the treatment of non-traumatic forms such as jaundice and post-partum haemorrhage two new therapeutic agents have been placed at the disposal of the doctor: Vitamin K and Oxalic Acid.

Vitamin K

It is ten years since Dam of Copenhagen made his original observations on the haemorrhagic tendencies of chicks placed on a fat-free diet. He attributed this condition to an avitaminosis, and labelled the deficient entity the "Koagulation Vitamin", vitamin K. It has since been established that the vitamin belongs to the fat-soluble group, and occurs chiefly in green vegetables, such as spinach and alfalfa. Highly potent crystals have been obtained from active oils, extracted from the above, but as yet no formula is available.

Interrelationship of Vitamin K and Prothrombin

It has been observed that jaundiced patients and animals with an experimental biliary fistula bleed excessively. More recently this excessive bleeding has been correlated with a deficiency of the plasma prothrombin, one of the necessary elements for the coagulation of blood. Dam found that his "haemorrhagic" chicks also had a low prothrombin level in the blood, thus accounting for the bleeding. Does this apply to patients exhibiting an abnormal tendency to bleeding?

A dog with a biliary fistula and a patient with an obstructive jaundice have one thing in common: bile is prevented from gaining access to the intestinal tract. Since bile is necessary for the absorption of fats from the intestine, would the lack of bile prevent the assimilation of this fat-soluble vitamin K, and so lead to a fall in plasma prothrombin with the consequent tendency to prolonged bleeding? Experimental results confirmed this theory and early in 1938 successful clinical application was reported. Pre-operative treatment of jaundiced patients by feeding bile salts and vitamin K concentrates had begun.

For the experimentalist there are questions yet to be answered. But though he is not satisfied as to the mode of action of vitamin K and the function of the liver in the deficiency, yet he has given to the clinician a preventive weapon in haemorrhage control; a weapon which is daily receiving positive confirmation.

Oxalic Acid

Oxalates are used in the prevention of blood clotting in vitro. No one then was more surprised than Arthur Steinberg, of the Kensington

Hospital in Philadelphia, to find that blood from a rabbit injected with oxalic acid clotted more rapidly than usual. Here is the story:

Steinberg was looking for a cheaper substitute for heparin in the prevention of "blood-clotting" in vivo e.g. thrombosis. In the course of the search he made extracts from plants, such as beets and rhubarb, and injected these extracts into rabbits. Instead of finding a decreased tendency to clotting in the blood of the injected animal, he found that the blood clotted in fifty per cent of the normal time. The search for the active principle in this phenomenon led to the isolation of oxalic acid from the extracts. Injections of small doses of oxalic acid were found to have the same effect as injection of the extracts.

Oxalic acid is generally regarded as a poison, but Steinberg has found 5.5-7.5 milligrams percent in the blood of normal individuals and as high as 17 milligrams percent in blood from the umbilical cord.

Injections of small doses of oxalic acid have been successful in clinical practice, for haemorrhage prevention, without any untoward effect. However, no comprehensive clinical report has appeared in the literature and many await further confirmation before employing oxalic acid in practice.

REFERENCES

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A certain confidence is assuredly of the utmost importance to a doctor's successful career. But as soon as it degenerates into megalomania, it is harmful.—*Albert Krecke.*

Knowledge lives in a laboratory; when it is dead we bury it in a decent book.—*Minot.*

In the field of observation chance favors the mind which is prepared.—*Pasteur.*

It was never meant that the working of the organs of our body should be watched by the mind, to make your patients think about their illness is to tamper with the laws of nature.—*Axel Munthe.*