

# South African Medical Journal

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### VAN DIE REDAKSIE

#### ENDEMIESE SKILDKLIERGESWEL IN SUID-AFRIKA

Op bladsy 617 van hierdie uitgawe verskyn 'n uittreksel van 'n verslag oor *Endemic Goitre in the Union of South Africa and some Neighbouring Territories*. Die verslag is opgestel deur 'n Komitee wie se aanstelling deur die Unie Departemente van Gesondheid en Voeding, die Universiteit Pretoria en die Raad vir Wetenskaplike en Industriële Navorsing goedgekeur is. Die verslag bevat waardevolle inligting oor die geografiese voorval en die oorsaak van kropgeswel in Suid-Afrika. 'n Kaart (wat in ons uittreksel verskyn) toon die streke aan waar endemiese kropgeswel voorkom wat volgens die Komitee se mening hoofsaaklik aan 'n jodiumtekort te wyte is en ander streke veral in Noordwes-Kaapland in die omgewing van Kenhardt, Gordonia en Springbok waar dit volgens hul mening veroorsaak word deur te veel fluor in onderaardse waters. Die rol wat fluor speel in die ontstaan van kropgeswel is nog nie beslis nie.

Oor die algemeen kom die jodiumtekort in die bergstreke van die ooste en die suide voor en dit word aanvaar dat die reent die jodium uit die grond geloog het soos dit die geval is in baie ander bergagtige dele van die wêreld. Dit is egter opmerkenswaardig dat kropgeswel in sommige dele voorkom wat nie bergagtig is nie soos in die Wes-Transvaal en veral die Kaprivistreek. In hierdie streke het die Komitee tekens van 'n primêre jodiumtekort gevind maar hul maak melding van die moontlikheid dat antiskildklierstowwe of faktore (insluitende 'n gebrek aan higiëne) miskien 'n jodiumtekort in die hand kan werk as die opname van jodium alreeds uiters laag is. Die oorsaak van die endemiese kropgeswel in die Kaprivi-streek is 'n vraagstuk wat vir 'n lang tyd al aandag geniet. Die mening is al uitgespreek dat sekere neute wat op groot skaal in daardie gebied genuttig word 'n antiskildklierstof mag bevat, maar hierdie teorie word deur die Komitee verwerp.

Die Komitee het gevind dat die jodium-inhoud van die water in die aarde in baie van die Weskaaplandstreke, waar endemiese kropgeswel voorkom, meer as hoog genoeg is en hul postuleer dat fluor as 'n teen-skildklierstof ageer. Teoreties is dit moontlik aangesien fluor 'n groter affiniteit vir die tiroksienmolekuul besit as jodium en derhalwe die neiging besit om die jodium te verplaas. Hierdie probleem is egter nog nie opgelos nie aangesien daar streke in die wêreld is waar die

### EDITORIAL

#### ENDEMIC GOITRE IN SOUTH AFRICA

On page 617 of this issue an abstract is published of the report on *Endemic Goitre in the Union of South Africa and some Neighbouring Territories* by a Committee in the appointment of which the Union Departments of Health and Nutrition, the University of Pretoria and the Council for Scientific and Industrial Research, were concerned. This report gives valuable information, which had not been readily obtainable previously, on the geographical incidence and causation of goitre in South Africa. A map (reproduced in our abstract) shows those areas in which endemic goitre, in the opinion of the Committee, is caused by primary iodine deficiency, and other areas, notably the North West Cape around Kenhardt, Gordonia and Springbok, where in the opinion of the Committee it 'is caused by excessive quantities of fluorine in subterranean waters'. It is, however, doubtful whether the causative role of fluorine has yet been finally established.

The areas of iodine-deficiency goitre in general correspond with the mountain belt of the east and south in which, in common with many other mountainous parts of the world, it is assumed that iodine is leached out of the soil by rain. It is noteworthy, however, that goitre occurs also in some areas which are not mountainous, such as the Western Transvaal and particularly the Caprivi Strip. The Committee finds evidence of primary iodine deficiency in these latter areas but suggests the possibility that antithyroid substances or factors (including lack of hygiene) may precipitate iodine deficiency on marginal intakes. The reason for endemic goitre in the Caprivi Strip has long been a subject of interested speculation and suggestions have been made that certain nuts which are extensively consumed in that area might contain an antithyroid substance. The Committee rejects this theory.

With regard to the incidence of endemic goitre in the Western Cape the Committee finds that the iodine content of the water and soil in many of the areas affected is more than adequate and postulates that fluorine acts as an antithyroid substance. This is indeed theoretically possible in that it has been shown that

fluor-inhoud van die watervoorrade te hoog is maar die toestand nie met kropgeswel gepaard gaan nie. Leone *et al.*<sup>1</sup> beskryf so 'n streek en die Komitee maak melding van 'n soortgelyke streek in Maldon, Essex en hul meen dat die afwesigheid van kropgeswel in hierdie streek te danke mag wees aan die hoë jodium-inhoud van die drinkwater en aan die vis wat geëet word. Dieselfde verklaring geld moontlik vir Ysland waar fluorose voorkom maar nie endemiese skildkliereswel nie.

Wat voorbehoeding en behandeling betref, beveel die Komitee die jodisasie van sout aan vir die kropgeswel, insluitende dié in die Kaprivi-strook, wat aan tekorte te wyte is. Ons lesers is miskien nie almal bewus van die feit nie dat jodisasie van sout die praktiese moeilikheid oplewer dat jodiede slegs by droë of geraffineerde sout gevoeg kan word. Die growwe kombuis-sout trek water en kan nie met welslae met jodiede behandel word nie. Dit is egter onlangs bewys dat jodate met veiligheid by sulke higroskopiese soute gevoeg kan word en dat dit net so doeltreffend is. Deeglike proewe wat onlangs in Guatemala<sup>2</sup> uitgevoer is het deurgaans gunstige resultate getoon.

In die streke waar die fluor-inhoud van die water hoog is, is die Komitee van mening dat die byvoeging van jodium nie die kropgeswel sal uitkakel nie en dat dit nodig sal wees om die fluor uit die water te verwyder. Dit sal vanselfsprekend van die grootste waarde wees as hierdie metode uitgetoets kan word en die resultate oor 'n lang tydperk bestudeer word.

Die verslag bevat waardevolle inligting met inbegrip van die omvattende besprekings oor die verband tussen jodiumtekort en vitamientekorte, en die verskeie tipes stowwe wat kropgeswel mag veroorsaak. Dit is 'n groot bydrae tot die bevordering van gesondheid in ons land.

1. Leone, F. L. *et al.* (1954): *Medical Aspects of Excessive Fluorine in Water Supply*. U.S. Publ. Hlth. Rep. No. 69, p. 925.
2. Ann. Rep. (1953-54) Inst. Nutr. Centr. Amer. Panama, Guatemala.

## CORTISONE AND TENDON HEALING

'In traumatic and reconstructive surgery one of the main problems is the restoration of the gliding action of a tendon after injury'.<sup>1</sup> This is especially important in the upper limbs, where the 'maintenance of mobility in the complicated and vulnerable system of the tendons of the hand'<sup>1</sup> is essential. Connective-tissue adhesions are prone to develop, partly as a normal healing process and partly as an unduly pronounced reaction to trauma. In an important experimental investigation, the results of which were recently published, Nils Carstam<sup>1</sup> has studied the effect of cortisone on the formation of tendon adhesions and on tendon healing. In tendon injuries, whether there is loss of continuity or not, the process of inflammation-repair is chiefly seen round the tendon—in the epitendon and paratenon—with the formation of adhesions.

In previous attempts to prevent adhesion formation the greatest advance was the work of Sterling Bunnell with his so-called 'atraumatic technic'.<sup>2</sup> Bunnell stressed

fluorine has greater affinity for the thyroxine molecule than iodine has and might therefore tend to displace iodine. The last word on this subject has, however, not been said, since there are areas in the world where excessive fluorine in the water supply is not associated with goitre. One such area is described by Leone *et al.*<sup>1</sup> The Committee itself quotes a similar area in Maldon, Essex, and suggests that the absence of goitre there may be due to a large amount of iodine in the drinking water and the consumption of fish, which has also been suggested as the explanation of the presence of fluorosis and the absence of endemic goitre in Iceland.

With regard to treatment and prevention the Committee recommends the almost universally supported iodization of salt for the deficiency group of goitres, including those of the Kaprivi Strip. Our readers may not all be aware that there is a practical difficulty in the iodization of salt, namely that iodides can only be added to dry or refined salt. The coarser cooking salts which are hygroscopic cannot successfully be treated with iodides. It has recently been shown, however, that iodates may be added safely to such hygroscopic salts and that they are equally effective. A recent considerable trial in Guatemala<sup>2</sup> reports uniformly favourable results.

In areas where the fluoride content of the water is high the Committee feels that the addition of iodine will not abolish goitre and that it will be necessary to remove fluorine from the water. A trial of the latter method with a long-term follow-up would obviously be of great value.

The report itself is full of valuable information, including a comprehensive discussion of the relationship of iodine deficiency to vitamin deficiencies and of the different types of goitrogenic agent, and constitutes a valuable service to the cause of health in South Africa.

1. Leone, F. L. *et al.* (1954): *Medical Aspects of Excessive Fluorine in Water Supply*. U.S. Publ. Hlth. Rep. No. 69, p. 925.
2. Ann. Rep. (1953-54) Inst. Nutr. Centr. Amer. Panama, Guatemala.

the importance of delicate handling of tissues and the prevention of dehydration, and he introduced new suturing methods. Amongst the other surgeons in this field are Pulvertaft, Koch, Mason and Allen, whose work has also improved tendon transfers and free tendon grafts. The antibiotics have naturally also brought about considerable improvement in the results. Despite these advances, however, the reaction of the tissue to injury is often sufficient in itself to lead to adhesion formation with impaired function of the tendon. Other workers have tried the interposition of organic and inorganic materials to prevent adhesion formation: autografts of fat and fascia have been used, while inorganic substances like cellophane and tantalum foil have also been tried. Polythene was found to decrease the formation of adhesions round sutured tendons, and healing did occur, provided the limb was immobilized for a sufficient length of time. This immobilization is necessary because the polythene

tube blocks the ingrowth of connective tissue and can actually prevent healing if blockage is complete.

Treatment with cortisone causes delay in the healing of primary and secondary wounds in the skin, and topical application of adrenocortical extract also seems to impair wound healing. Moreover, in animals the formation of peritoneal adhesions produced by different means can be suppressed by the administration of cortisone. The healing of fractures, experimental arthritic changes, the formation of granulation and fibrosis round foreign bodies, can be inhibited by cortisone.

Carstam set out to investigate in the rabbit the influence of cortisone upon the healing of tendons and upon the development of adhesions after injury. As a result of his experiments he concluded that (a) the parenteral administration of cortisone to rabbits suppressed the formation of adhesions round a traumatized extensor hallucis longus tendon. The dosage of cortisone was important and also the stage at which therapy was instituted. The best results were obtained when cortisone therapy was begun 3 days before operation. (b) Cortisone in a dosage large enough to suppress adhesion formation round a traumatized extensor hallucis longus tendon of one leg did not appreciably influence healing of a contralateral sutured Achilles tendon, provided the tendon could be properly immobilized in a position of relaxation.

It has been shown experimentally that the topical application of cortisone adversely influences the pro-

liferation of connective tissue. Clinically the local effect of cortisone has been utilized successfully, particularly in the treatment of eye diseases. Hollander, Brown and Jessar<sup>3</sup> injected both cortisone and hydrocortisone intra-articularly into rheumatoid and osteoarthritic knee joints, and found hydrocortisone far superior to cortisone. The cortisone often failed to produce a response and on occasions proved to be irritating. In Carstam's experimental series he found that the topical commercial cortisone acetate did not diminish adhesion formation round a tendon and caused persistent inflammatory irritation. This was also present when the vehicle alone was used. He did not use hydrocortisone topically, and he is at present engaged on an investigation using hydrocortisone.

Carstam concluded that where tendon suture is required cortisone should be used with caution and only in cases where the limb can be immobilized with the tendon relaxed. This is in order to avoid the risk of impaired healing and the early separation of the tendon ends. However, in reconstructive surgery not requiring tendon suture, e.g. tendolysis, the depressive effect of cortisone on tissue reaction might be utilized with advantage in inhibiting the re-formation of tendon adhesions.

1. Carstam, N. (1953): *Acta chirurg. Scand., Suppl.*, p. 5.
2. Bunnell, S. (1948): *Surgery of the Hand*. Philadelphia, London and Montreal: Lippincott.
3. Hollander, J. L., Brown, E. M. and Jessar, R. A. (1951): *J. Amer. Med. Assoc.*, **147**, 1629.

### MEDICAL FEES UNDER THE WORKMEN'S COMPENSATION ACT

The tariff of fees was drawn up soon after the Workmen's Compensation Act was passed in 1941. Since that time great economic changes have taken place, in consequence of which medical fees generally have increased in accordance with the rise in wages and salaries and in the cost of living. The fees payable under the Act have lagged far behind this general increase, and for a considerable time the Association's Workmen's Compensation Act Subcommittee has been negotiating with the Workmen's Compensation Commissioner in order to secure a proportionate increase in the tariff.

The Commissioner attended the meeting of the Federal Council which was held in October 1954, and discussed an offer he had made to institute a 25% increase in the schedule. This offer was accompanied by a proviso that no further changes should be made in the tariff for 3 years, which would give the Commissioner the opportunity of seeing how the changes would

affect the Fund. Federal Council accepted the increase on behalf of the Association, on condition that an attempt be made to have the schedule completely revised within the 3 years. The 25% increase came into operation at the beginning of 1955.

The Government of Southern Rhodesia has now published a tariff of medical fees under their Workmen's Compensation Act, and an abstract of the tariff is published in this issue (page 620). The general level of the fees is substantially higher than in the schedule under which doctors are working in the Union. For instance, the Southern Rhodesian fee for a visit (non-Native) is 15s., as compared with 9s. 4½d. (7s. 6d. increased by 25%) in the Union; the difference is less if the patient is a Native. Our neighbours' tariff will be scrutinized with great interest in the Union, and will doubtless be taken into consideration both by the Workmen's Compensation Commissioner and the Association in framing the new tariff for the Union.