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GROWTH HORMONE, PREGNANCY AND DIABETES

Growth hormone (GH) is well established as a powerful diabetogenic agent in many animals, as summarized by Kyle.[1] It is also a tremendously powerful stimulant of insulin production, but at the same time it reduces the sensitivity of tissues to insulin, antagonizes some of its actions (e.g. in the mobilization of fat) and reduces its hypoglycaemic effect. The diabetogenic potentialities of human GH in man have been shown by Pearson[2] and Luft[3] and their co-workers; in *normal* man, however, GH is not outstandingly diabetogenic. In acromegaly the excessive GH production leads to diabetes in only around 20% of patients[4,5]—it may well be that this 20% are genetically constituted (pre)diabetics to start with. Young[6] has suggested that a temporary oversecretion of GH may be an important factor in the production of ordinary diabetes, and that the only permanent result would be damage to pancreatic islets with consequent permanent diabetes. As yet there is no good direct evidence in favour of this thesis, which awaits the application of modern GH immuno-assay methods to subjects with 'prediabetes'. Kalkhoff *et al.*[7] found the GH levels in ordinary genetic diabetes to be normal.

In 1957 it was reported that about three times the normal growth-promoting activity was present in the plasma of pregnant rats,[8] but it was found that this activity was not diminished by hypophysectomy and was therefore not due to a pituitary growth hormone.[9] It is now clear that the substance responsible, which closely resembles pituitary GH, is produced in large amounts by the normal placenta, and it has become known as 'placental lactogen' (PL).[10,11]

Kalkhoff and co-workers[7] found during pregnancy that: (1) the blood sugar and free fatty acid (FFA) levels responded normally to a glucose load, but the plasma insulin rose more than in the non-pregnant state, and (2) after tolbutamide, lesser decreases in blood sugar and greater increases in plasma insulin occurred. In pregnant *diabetics* compared with pregnant non-diabetics they found (1) after glucose load, greater increases in plasma sugar and insulin, and (2) after tolbutamide, lesser decreases in blood sugar and greater increases in plasma insulin. During pregnancy they found significant increases in fasting plasma FFA, the increases being greater in diabetics than non-diabetics, but after a glucose load the percentage decrease was the same in diabetics and non-diabetics, and the same as in non-pregnant normals. Therefore, pregnancy produces significant peripheral antagonism to insulin and hypersecretion of insulin following glucose or tolbutamide. The authors state that the refractoriness to insulin seems to involve muscles (decreased glucose tolerance) much more than adipose tissue (more normal FFA response to glucose). These metabolic alterations are similar to those associated with increased GH.[12]

Kalkhoff *et al.*[7] also found during pregnancy a marked increase in growth hormone-like substance (GHLS), with a rapid decline following delivery which was associated with a pronounced improvement in the abnormal response to glucose and tolbutamide. The level of GHLS in diabetics at delivery was less than that of non-diabetics; in each group the decline was rapid after delivery, attaining an essentially normal level in 8 hours. GHLS in the cord blood of non-diabetics was much higher than in the cord blood of diabetics. The authors concluded that most of the cord blood in GHLS was of foetal pituitary origin, but most of the GHLS in maternal blood was placental lactogen. They suggested that placental lactogen may represent the major factor responsible for insulin antagonism in the pregnant state, due to its own growth hormone-like activity or its synergistic effect on pituitary GH. However, it is noteworthy that they found no greater amounts, in fact rather lesser, in diabetic pregnancies than in normal ones.

Kaplan and Grumbach[13] confirmed some of these findings, noting that the amounts of human PL in maternal serum at term were almost 1,000 times those of GH, whereas only negligible amounts of PL were detected in the foetal circulation. Beck and co-workers,[14] agreeing with this, pointed to the inability of human PL to cross the placenta. On the other hand, very high GH levels have been found in cord blood by Beck *et al.*[14] and Cornblath *et al.*,[15] presumably arising from the foetal pituitary gland.

Beck and co-authors remark that the failure to find increased levels of human PL in diabetic patients during pregnancy does not indicate that this peptide hormone might not be concerned with the change in carbohydrate tolerance. It is possible that individuals destined to develop gestational diabetes have increased responsiveness to the suspected diabetogenic action of human PL.

There is certainly a great deal to suggest GH overactivity during pregnancy. In pregnancy the pituitary gland is hypertrophied, morphological islet changes resemble those produced by GH in dogs, insulin production is increased, and there is a diminished sensitivity to insulin. The excessive size of the diabetic's and prediabetic's baby also suggests a greater GH effect in diabetics than in non-diabetics, although there are arguments against this.[5] GH and/or placental lactogen may well be implicated in the diabetogenic effect of pregnancy.

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DERDE WÊRELDKONGRES OOR MEDIESE OPVOEDING

Die Derde Wêreldkongres oor Mediese Opvoeding word later hierdie jaar (20 - 25 November) in Nieu Delhi in Indië gehou. Dit sal plaasvind onder beskerming van die Mediese Vereniging van die Wêreld en die Panamerikaanse Gesondheidsorganisasie. Die hooforganiseerder van hierdie belangrike kongres is die bekende Suid-Afrikaanse geneesheer, dr. H. S. Gear, tot onlangs voltydse Sekretaris-generaal van die Mediese Vereniging van die Wêreld, met sy hoofkantoor in New York.

Hierdie kongres word op 'n belangrike tydstip in die ontwikkeling van ons gedagtes op hierdie gebied gehou. Orals oor die wêreld word die dringende probleme in hierdie verband gedurig bespreek. Die kernprobleem skyn te wees om te besluit hoe om die kliniese behoeftes van ontwikkelende en gevestigde lande te versoen met die vinnige ontwikkeling van die wetenskaplike medisyne en die daarmee gepaardgaande veranderinge van die patroon van die mediese praktyk oor die algemeen.

Ook in Suid-Afrika is ons deeglik bewus van die probleme waarvoor ons in hierdie verband staan—soos dit dan ook duidelik geblyk het uit die vrugbare besprekinge ten tye van die Eerste Suid-Afrikaanse Kongres oor Mediese Opvoeding wat in Julie 1964 in Durban gehou is. Die volledige handelinge[1] van hierdie kongres is in 1965 gepubliseer en dit is bespreek in hierdie kolomme[2] op 29 Mei 1965.

'n Bespreking van die probleme van mediese opvoeding op wêreldvlak is belangrik op hierdie stadium omdat so baie van die ontwikkelende lande in Afrika en Asië en elders voor die probleem staan van hoe om mense op te lei om gesondheidstoestande te hanteer wat grootliks verskil van die toestande in die hoog-geïndustrialiseerde lande van die wêreld. En, soos ons alreeds in die verbygaan aangemerk het, moet ons gedurig die uitdaging aanvaar van hoe om dokters só op te lei dat hulle op die hoogte van nuwe ontwikkelinge en tendense bly wat net so vinnig verander soos die samelewings waarin hulle voorkom. Hoe om die beste soort mediese dienste te verseker vir elke soort van gemeenskap in die wêreld, is die groot probleem.

Die algemene teme van die kongres in Nieu Delhi is: Mediese opvoeding as 'n faktor in sosio-ekonomiese ontwikkeling, en vier hoofonderwerpe sal bespreek word:

1. Sosiale verandering en wetenskaplike vooruitgang—hul verband met mediese opvoeding.
2. Mediese opvoeding en nasionale struktuur.
3. Die organisasie van mediese opvoeding om aan te sluit by die veranderende behoeftes van die gemeenskap.
4. Die beplanning van nuwe programme van mediese opvoeding.

Dwarsoor die wêreld is daar 'n tekort aan geneeshere en mediese fasiliteite, sodat dit van haas elke gemeenskap in die wêreld gesê kan word dat die behoefte aan mediese aandag die vermoë om dit te gee, oorskry. Die opleiding van werkers in die mediese hulpdienste word dus van ewe groot belang as die opleiding van geneeshere self. Op hierdie en verwante aspekte van dié belangrike probleem behoort die kongres in Nieu Delhi lig te werp, veral omdat die gedagtes wat uitgespreek en die idees wat bespreek sal word, sal staan teen die perspektief van die probleme van die meeste lande in die wêreld.

Die Indiese Mediese Vereniging sal as gasheer vir die Kongres optree, en die president van die kongres is Sir A. L. Mudalair, Vise-kanselier van die Universiteit van Madras. Onder die internasionale vise-presidente van die kongres is Sir Arthur Porritt, 'n gewese president van die Royal College of Surgeons en van die Britse Mediese Vereniging. As beskermheer tree op die President van Indië, dr. S. Radhakrishnan. Die handelinge van hierdie kongres sal gepubliseer word en, indien die patroon van vorige publikasies op dié gebied gevolg word,[3] behoort dit van groot en blywende waarde te wees vir almal wat belang stel in die probleme van mediese opvoeding, hier en elders in die wêreld.

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ARTICLES CONTRIBUTED BY GENERAL PRACTITIONERS

The *Journal's* articles range from those of interest to all doctors to rather highly specialized ones which are read mainly by those whose particular field they cover.

The policy of the *Journal* is to cover all aspects of medicine, and apart from its special issues on Radiology, Obstetrics and Gynaecology, Laboratory and Clinical Medicine, etc., there are 38 issues per year which are suitable for the publication of articles or case reports of a general nature, if of sufficient standard for publication.

In every general practice (and some of these are extremely large) there is a wide variety of case material and interesting patients. However, very few general practitioners submit contributions for publication. We realize that most general practitioners are extremely busy, but it would be a good thing if the time could be found to submit short articles or case reports. Often it is the general practitioner who first sees, diagnoses and, if necessary, refers patients to his specialist colleagues. That material exists in these practices, which would be of interest to members in other branches of the profession, is certain.

We should like to encourage general practitioners to write on particular subjects in which they are interested, submit unusual clinical material in the form of case reports and, even better, to join with their specialist colleagues as co-authors in articles which we are certain would interest the medical profession as a whole.

Two misconceptions need to be corrected. Firstly, that the *South African Medical Journal* will only accept highly specialized articles, and secondly that the general practitioner considers that 'he is not a scribe'. It is important that our colleagues in general practice should put their doubts behind them and contribute what would undoubtedly be interesting subject matter and thereby stimulate others in a similar vein.