

# South African Medical Journal

## Suid-Afrikaanse Tydskrif vir Geneeskunde

### EDITORIAL

#### REDUCING DIETS

It has long been known that restriction of calorie intake is the most important factor in the loss of excess weight. The traditional medical advice to patients wanting to reduce always includes a 'diet sheet' which, if it is scrupulously followed, cuts down the calorie intake to below the level supposed to be necessary for the maintenance of a dietary equilibrium. Experience has shown that this measure does not always lead to weight loss. Although discrepancies are usually attributed to failure or inability of the patient to carry out his instructions, the frequency of the experience has been noted. Moreover, slight departures from—not restrictions of—the normal diet appear sometimes to lead to loss of weight, and one set of workers found in a test series that persons on a high-fat diet lost weight more rapidly than those on high-protein or high-carbohydrate diets.<sup>1</sup> This uncertainty led Kekwick and Pawan<sup>2</sup> to examine the relation of calorie intake to obesity a little more closely. The question that these workers set themselves to answer was this: Is it the restriction of total calorie intake that causes the weight loss, or is it the alteration in proportions of carbohydrate, fat and protein in the diet? The normal sedentary worker—it is usually stated—takes his daily 2,200 calories as 12% of protein, 24% of fat and 64% of carbohydrate, while the average reducing diet (yielding about 1,000 calories a day) consists of protein, fat and carbohydrate in about equal proportions. Kekwick and Pawan's experiment was conducted on cases of obesity in a hospital ward under the most favourable conditions; none of the patients could 'sneak' any food and rigid biochemical controls (water retention, nitrogen balance, fat absorption) were performed. The patients fell into 3 groups for the purpose of the experiment, viz.:

1. A group fed on a diet of which the component proportions were the same (protein 20, fat 33, carbohydrate 47) but the total amounts varied (500, 1,000, 1,500 and 2,000 calories).

2. A group fed on a diet of which the total calorie-content was fixed (1,000 calories) but the components

### VAN DIE REDAKSIE

#### VERSLANKINGSDIËTE

Dit is lank reeds bekend dat beperking van kalorie-opname die belangrikste faktor by die verlies van oortollige gewig is. Die tradisionele mediese advies aan pasiënte wat gewig wil verloor, sluit altyd 'n 'diëet-kaart' in wat, as dit stip gevolg word, die kalorie-opname verminder tot onder die peil wat vermoedelik nodig is om 'n diëet-ewewig in stand te hou. Ondervinding het getoon dat hierdie maatreël nie altyd gewigsverlies veroorsaak nie. Alhoewel teenstrydighede gewoonlik toegeskryf word aan die pasiënt se versuim of onvermoë om sy instruksies uit te voer, is daar op gelet hoe dikwels ondervinding homself herhaal. Bovendien skyn dit of geringe afwykings—en nie beperkings nie—van die normale diëet somtyds tot gewigsverlies lei, en een groep navorsers het, deur middel van 'n toetsreeks, gevind dat persone op 'n diëet met 'n hoë vetgehalte, vinniger gewig verloor het as diegene wat op 'n diëet 'n hoë proteïen- of hoë koolhidraatgehalte, was.<sup>1</sup> Hierdie onsekerheid het Kekwick en Pawan<sup>2</sup> daartoe gelei om die betrekking wat kalorie-opname op vetsug het, ietwat nader te ondersoek. Die vraag wat hierdie navorsers aan hulself gestel het om te beantwoord, was: Is dit die beperking van algehele kalorie-opname wat die gewigsverlies veroorsaak, of is dit verandering van die verhoudings tussen koolhidraat, vet en proteïen in die diëet wat dit veroorsaak?

Die normale, sittende werker—so word gewoonlik verklaar—neem sy daaglikse 2,200 kalorieë in die vorm van 12% proteïen, 24% vet en 64% koolhidraat op, terwyl die gemiddelde verslankingsdiëet (wat sowat 1,000 kalorieë per dag lewer), uit ongeveer gelyke verhoudings van proteïen, vet en koolhidraat bestaan. Kekwick en Pawan se eksperiment is uitgevoer op gevalle van vetsug in 'n hospitaalsaal onder die gunstigste omstandighede; geeneen van die pasiënte kon enige voedsel 'in smokkel' nie, en streng biochemiese kontrole (waterbehoud, stikstofbalans en vet-opname) is uitgevoer. Vir eksperimentele doeleindes, het hulle die pasiënte in 3 groepe ingedeel, naamlik:

1. 'n Groep gevoed op 'n diëet waarvan die samestellende verhoudings dieselfde was (proteïen 20, vet 33, koolhidraat 47), maar waarvan die totale hoeveelhede afgewissel het (500, 1,000, 1,500 en 2,000 kalorieë).

2. 'n Groep gevoed op 'n diëet waarvan die totale kalorie-inhoud vasgestel was (1,000 kalorieë), maar waarvan die bestanddele afgewissel het. Drie verskillende diëte is gebruik, elk waarvan 90% van een bestanddeel bevat het.



varied. Three different diets were used, each of which consisted of 90% of one component.

3. A group whose diet was stabilized on a normal (2,000 calories) daily diet. They were changed to a 2,600-calorie diet, alternatively of high-fat and high-protein composition, to see whether they lost weight in confirmation, more or less, of the results in group 2.

Although the entire experiment was neither large, nor prolonged, it appears to have been conducted with a thoroughness that makes the results noteworthy, even if they do not find general acceptance.

The results of the first series bore out the generally-accepted view that the less a person eats the faster he will lose weight. By making weekly alterations in the total daily calorie-intake of each patient, Kekwick and Pawan demonstrated a clear proportional relationship between intake and weight loss. The second series yielded more interesting results; here the total calorie-intake could still be regarded as a reducing diet (1,000 calories), yet the patients on the 90%-carbohydrate diet lost no weight at all while the losses on those on the 90%-protein and 90%-fat diets were marked. Some patients of the latter groups lost 1-1½ lb. a day. The response of patients in the third group provided confirmation of Kekwick and Pawan's thesis that—within limits—it is the substance of the diet that is important rather than the amount. By feeding with 600 calories over the 'normal' they recorded actual losses in weight in some of their patients—provided the whole diet was a high-fat or a high-protein one.

By means of biochemical checks that they carried out in these experiments Kekwick and Pawan were able to show that there was no defective absorption to account for the weight loss, nor any significant loss of carbohydrate stores or body protein. Slightly less than half the weight lost was shown to be due to loss of body water, and 50-70% to loss of body fat. The rate of water loss is greater with high-fat and high-protein diets; this fact—together with the marked variations in weight loss between the different constant-calorie diets—is taken to suggest that obese persons alter their metabolism in response to variations in the diet. Kekwick and Pawan draw no practical conclusions from their experiments, and they have been taken to task for their brevity, 7-9 days being very short periods for studying changes of weight in obesity,<sup>3</sup> and for their conclusions over the role of body water in weight loss. From their own data the striking increase in water loss would itself account for about 70% of the weight lost with the high-protein or high-fat diets—and proportionately less therefore would be due to loss of body fat.

3. 'n Groep wie se dieet op 'n normale (2,000 kkalorieë) daaglikse dieet gestabilleer was. Hulle is oorgeplaas op 'n dieet van 2,600 kkalorieë, waarvan die samestelling alternatief van 'n hoë vet- of van 'n hoë proteïengehalte was, om te sien of hulle gewig verloor het, wat sodoende min of meer die resultate by groep 2 verkry, sou bevestig.

Alhoewel die hele eksperiment nóg groot nóg van lange duur was, skyn dit of dit met 'n deeglikheid uitgevoer was, wat die resultate opmerkingswaardig maak, al word hulle nie algemeen aanvaar nie.

Die resultate van die eerste reeks het die algemeen-aangenome mening bevestig dat, hoe minder 'n persoon eet, hoe vinniger hy gewig sal verloor. Deur elke pasiënt se totale daaglikse kalorieopname weekliks te verander, het Kekwick en Pawan gedemonstreer dat daar 'n duidelike proporsionele verwantskap tussen opname en gewigsverlies bestaan. Die tweede reeks het interessanter resultate opgelewer; hier kon die totale kalorie-opname (1,000 kkalorieë) nog as 'n verslankings-dieet beskou word, tóg het die pasiënte op die 90%-koolhidraatdieet glad geen gewig verloor nie, terwyl die gewigsverliese van diegene op die 90%-proteïen- en 90%-vetdiëte, opvallend was. Sommige pasiënte in die laasgenoemde groep het 1-1½ lb. per dag verloor. Die wyse waarop pasiënte in die derde groep gereageer het, het Kekwick en Pawan se tesis bevestig dat—binne perke—dit die inhoud van die dieet, eerder as die hoeveelheid is, wat belangrik is. Deur hulle pasiënte met 600 kkalorieë bó die 'normale' te voed, het hulle verwagte gewigsverliese by sommige van hulle pasiënte aangeteken—op voorwaarde dat die hele dieet van 'n hoë vet- of hoë proteïengehalte was.

Deur middel van biochemiese toetse wat hulle by hierdie eksperimente uitgevoer het, was Kekwick en Pawan in staat om aan te toon dat daar geen gebrekkige opname was om die gewigsverlies te verklaar nie, nóg was daar enige betekenisvolle verlies van koolhidraatvoorrade of liggaamsproteïene. Dit is getoon dat effens minder as die helfte van die gewig wat verloor was, aan verlies van liggaamswater, en 50%-70% aan verlies van liggaamsvet te wyte was. Die tempo van waterverlies is groter by diëte met 'n hoë vet- en hoë proteïengehalte; dit word aangeneem dat hierdie feit—tesame met die opvallende variasies van gewigsverlies tussen die verskillende kalorie-konstante diëte—suggerer dat vetsugtige persone hulle metabolisme as gevolg van variasies in die dieet verander. Kekwick en Pawan maak geen praktiese gevolgtrekking van hulle eksperimente nie, en hulle is berispe oor die kortstondigheid daarvan omdat periodes van 7-9 dae baie kort is om gewigsveranderinge by vetsug te bestudeer,<sup>3</sup> en oor hulle gevolgtrekkings van die rol wat liggaamswater by gewigsverlies speel. Uit hulle eie gegewens is die opvallende toename in waterverlies skynbaar alleen verantwoordelik vir 70% van die gewig verloor by die diëte met 'n hoë proteïen- of hoë vetgehalte—en gewigsverlies te wyte aan verlies van liggaamsvet, sou dus proporsioneel kleiner wees.

1. Lyon, D. M. and Dunlop, D. M. (1932): *Quart. J. Med.*, **1**, 331.
2. Kekwick, A. and Pawan, G. L. S. (1956): *Lancet*, **2**, 155.
3. Hervey, G. R. (1956): *Ibid.*, **2**, 355.

1. Lyon, D. M. en Dunlop, D. M. (1932): *Quart. J. Med.*, **1**, 331.
2. Kekwick, A. en Pawan, G. L. S. (1956): *Lancet*, **2**, 155.
3. Hervey, G. R. (1956): *Ibid.*, **2**, 355.