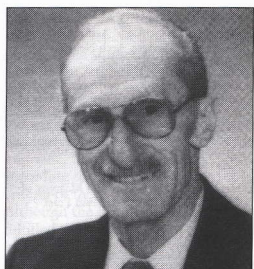


Inflammatory bowel disease: individualised dietary therapy



Curriculum Vitae

Dr Gus Borok obtained a BSc at Rhodes and then an MB BCh at Wits (in 1950). He has been in both hospital, rural and urban private practice for 45 years. His interest in foods began when he visited the clinic of Dr Marshall Mandell, president of the American Ecological Society in Norwalk, Connecticut in January 1983. Subsequently he has presented papers at both national and international congresses on topics associated with foods triggering symptoms in various recurrent chronic maladies from asthma, coronary artery thrombosis, depression, hypercholesterolaemia, hypertension, irritable bowel syndrome, ulcerative colitis to "Yuppie Flu". Many letters have appeared in medical journals in this regard and articles on his studies have been published or are to be published in several South African medical journals. He is married and has five children and six grandchildren.

Prof Isidor Segal qualified at Wits in 1962. His main interest has been in the bowel and he was instrumental in the establishment of the Gastroenterology Unit at Baragwanath Hospital which has acquired an international reputation for its work on third world populations. Prof Segal has written many articles and received several local awards for his work. He has been invited and has given lectures at international university institutions and congresses in Sao Paulo, New York, Tel Aviv, Jerusalem, Haifa and China. Currently he is Professor ad Hominem and head of medical gastroenterology at Witwatersrand University teaching hospitals. He is married, has three children and two grandchildren.

Summary

A project was done in the Johannesburg Hospital on a group of patients who suffered with inflammatory bowel disease (including Crohn's Disease and Ulcerative Colitis) treating them with a personalised elimination diet. All of these had previously been on cortisone, meticorten or other drug therapies. The purpose of this trial was to identify foods which may trigger their symptoms. The results are given and discussed but six of the seven patients in the active trial group were symptom-free after only a few months on the diet.

Introduction

Inflammatory bowel disease (BD) includes both Crohn's Disease (CD) and Ulcerative Colitis (UC).

Crohn's Disease (CD)

CD is a chronic inflammatory disease of unknown aetiology which may affect any part of the alimentary tract but which has a predilection for the small intestine, the ileocolic region and the large intestine.

The disease is characterised by a wide spectrum of clinical manifestations, including extra-intestinal manifestations, but the most common present-

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KEYWORDS

Crohn's Disease;
Colitis, ulcerative;
Diet therapy.

IBD = Inflammatory Bowel Disease

CD = Crohn's Disease

UC = Ulcerative Colitis

TPN = Total Parenteral Nutrition

ED = Elimination Diet

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ing symptoms are diarrhoea, weight loss and cramping abdominal pain.¹ The commonest clinical signs include fever, peri-anal disease, internal or external fistula formation and an abdominal mass. The course is prolonged, complicated and indolent with unpredictable exacerbations and remissions.² The salient histopathological feature is inflammation involving all the layers of the gut wall with infiltration by lymphocytes and plasma cells, particularly of the submucosal, muscular and serosal layers. Epithelial non-caseating granulomas are identified in 50% of cases.²

Ulcerative Colitis (UC)

UC is a chronic inflammatory disease of unknown aetiology which affects the large bowel. The most common sites involved are the rectum and left colon, but the entire colon may be involved. In contrast to CD, UC is confined to the mucosa, and to a lesser extent to the adjacent submucosa.³ The deeper muscular layers and serosa are usually not involved. Crypt abscess formation and non-specific acute and chronic inflammation (which may be patchy or diffuse) are diagnostic microscopic findings.⁴

Rectal bleeding and diarrhoea are the most important symptoms of a disease with severe local and systemic complications. The course is characterised by remissions and exacerbations. In 10-15% of cases it is difficult to differentiate between CD and UC or make a histological diagnosis between the two. Some cases are diagnosed as UC initially and later labelled CD and both conditions may coexist in the same patient.⁵

Immunological, psychological, infective and dietary theories have been postulated in both CD and UC. Many therapies have been advocated, as one can expect for diseases of unknown aetiology with a prolonged and variable course. Because diet has been

implicated in the aetiology of IBD, dietary measures have traditionally been prescribed. Fibre free diets for those with diarrhoea and increased fibre for those with constipation. More recently diet has been advocated as a primary therapy.⁶

Total parenteral nutrition (TPN) has been successful in healing fistulae in patients with CD and has induced remissions in acute cases by allowing the bowel to rest. Remissions in IBD can also be achieved more economically and with fewer complications by elemental diets. Elemental diets were used in space programmes and some cases of CD found their symptoms improved.⁶ Feeding patients with active CD with a polymeric diet, which contains intact proteins was not as good as an elemental diet in relieving symptoms.⁷

The elemental diet proved to be superior to prednisolone in active cases of CD.⁸ On the other hand TPN used as adjunctive treatment, in a controlled diet, did not benefit patients with UC.⁶ Infantile colitis has been related to cow's milk,^{9,10} small bowel villi atrophy to soya,¹¹ fish, rice and chicken¹² and proctitis to certain foods.¹³ In the experience of the authors both irritable bowel syndrome and UC can be relieved by using an elimination diet (ED).^{14,15}

Eleven cases of UC showed a significant improvement compared to controls using the same ED at Groote Schuur Hospital, Cape Town.¹⁶ The present trial was to determine whether patients with IBD at the Johannesburg Hospital would improve on ED.

Patients and methods

Thirty patients from the gastroenterology department of the Johannesburg Hospital with a history of bloody diarrhoea, were contacted to partake in a trial. The purpose of the trial was to use the ED to identify foods which

When elemental diets were used in space programmes, some CD symptoms improved.

One out of every three patients won't even attempt to go on an elimination diet.

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may trigger their symptoms. The method used in the ED was explained to each subject. Queries were answered and 14 patients agreed to enter the trial. Each had been documented as patients with IBD. Eleven patients were diagnosed as UC, two as CD and one as post radiation proctitis.

It has been our experience that one out of three patients fully informed of the requirements of the ED will not even attempt to go on the diet. Furthermore, of those patients who opt to go on the diet, one third do not stick to the rules of the ED and fall out in the first week or two. As there were only 14 patients, it was felt that randomising the patients into control and trial groups would lead to insufficient numbers in the trial group completing the requirements of the diet to be of any significance. Therefore it was decided that those who volunteered to stick to the rules of the ED would be the active trial group. Seven patients volunteered to go on the ED and they became the active group. The other seven who doubted the benefit of the diet automatically fell into the control group.

The history of each patient was completed on a questionnaire and their symptoms graded from 0-4 where 0 represents no symptoms to increasing grades of severity from 1-4 and 4 represents the worst grade where the patient was unable to work. As so many experimental patients became symptom free, the results are given only in symptoms present and absent categories. The diet was prescribed according to each patient's likes, dislikes and idiosyncrasies. The diet for each week was written on a special form. Each meal had one or two different foods and no individual food was repeated in the week. The patient recorded the severity of symptoms between meals in the space provided. The patients returned weekly, when offending foods were replaced by

other foods until symptom free or no further improvement was evident.¹⁴

RESULTS

Control group

The seven subjects' mean age was 45,8 years with a mean duration of symptoms of 11,3 years. There were four males and three females. They continued with their usual eating pattern and therapy.

Previous therapy

All these subjects had received oral cortisone and predsol enemas for the acute attacks. Three were taking cortisone enemas and five were on oral cortisone (one was on both oral and rectal cortisone). All seven were on either salazopyrin or asacol at the beginning and end of the trial.

Follow up after six to nine months (Table 2)

Six of the seven subjects still had symptoms and were on the same treatment. Two had severe relapses which required hospitalisation. Two others had relapses which were controlled on outpatient treatment. The symptoms of one of the control group improved over the six months and was off therapy.

Trial group

The seven subjects, four women, three men, with a mean age of 50,4 years had a mean duration of symptoms of 10,8 years. One patient stopped the diet after the first week so that there were only six active patients at the end of three months.

Previous therapy

On entry to the trial, three patients were on cortisone enemas and three on oral meticorten. Six of the subjects were on either salazopyrin or asacol orally.

Quite difficult to stick to the rules of the ED.

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Follow-up at three months (Table 1)

Six subjects who remained on the diet showed marked improvement. None

therapy at the end of three months. One patient was on half the previous dosage and two patients were reluctant to reduce their therapy as advised by their consultant.

	Trialists 6		Controls 8	
	Before the ED	After the ED	Before 3 months	After 3 months
Diarrhoea	6	0	8	8
Blood	6	1	8	7
Mucus	6	0	7	7
Atopy sinusitis	5	0	5	5
Asthma	2	0	5	5
Urticaria	1	0	1	1

Foods were found to trigger symptoms in nine out of 11 patients with UC.

had diarrhoea or mucus and only one had spotting of blood occasionally but much less than before.

One patient's symptoms cleared in three weeks, two patients' in five weeks, two patients' in eight weeks and one patient took three months for symptoms to clear.

The previous therapy was continued in all patients until they felt there was no need for such therapy. Three were off

Follow-up at six to nine months (Table 2)

The one patient who had stopped the diet after the first week went back on the diet with relief of her symptoms. Six of the seven subjects were symptom free and four had stopped all therapy. One subject was being weaned off her therapy and two subjects even though symptom free when off therapy, were told not to stop salazopyrin by the consultant. Only one subject was

Apples contain 243 different chemicals of which the aroma alone has 58.

	Trialists 7		Controls 7	
	Before the ED	After the ED	Before 6-9 months	After 6-9 months
Diarrhoea	7	1	7	6
Blood	7	1	7	6
Mucus	7	1	7	5
Atopy sinusitis	5	0	5	5
Asthma	2	0	1	1
Urticaria	1	0	1	1

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still having two to three watery stools a day with blood once or twice a week. This patient could not stop eating bread, which triggered the diarrhoea and blood in his stools, because of his craving for bread.

Atopy occurred commonly in both groups. Sinusitis was the most common occurring in five of the seven subjects in both groups. Asthma occurred in two of the trial group and in one of the control group. Each group had one case of urticaria. The atopic symptoms, in the five patients with atopy in the trial group, cleared but there was no improvement of the atopic symptoms in the control group.

DISCUSSION

One active patient fell out of the trial after the first week, leaving only six patients in the active trial group at three months. When the patient heard how a friend had benefited she went back on the diet and her symptoms improved rapidly without any therapy. One patient could not refrain from eating his favourite food, bread. Thus at six months there were seven patients in each group. The symptoms of one of the control group improved without any change in her treatment. Though it may be difficult for some patients to stick to the rules of the ED, this does not in any way detract from the possible benefit of the ED.

The natural history of IBD is characterised by remissions and exacerbations. When patients respond to dietary therapy the argument arises whether it may be a natural remission or not. Only one patient of the control group went into remission whereas six of the seven in the trial group did so. Trials have shown that foods are associated with triggering symptoms in CD, but it is not certain whether foods play a primary role or an adjunctive role.⁶ It is accepted that foods play a definite role in cases of infantile UC.^{9, 10}

However, with regard to adults this is uncertain.^{15, 17}

Some deny foods play a role in adult UC as the elemental diet relieved symptoms in CD but not in UC.⁶ However foods, on repeated exposure, were found to trigger symptoms in nine out of 11 cases of UC, five of whom were in remission only after six weeks.¹⁶ Similar improvement in symptoms has been shown in this trial on withdrawal of the foods implicated by the ED.

The manner in which foods affect the bowel may be an allergic, chemical, pharmacological or physical reaction to the properties of chemicals in the foods eaten. The allergic reaction to proteins is supported by reports of the relief of bowel symptoms when milk was removed from patients with CD¹⁷ and the elevation of IgE anti-cow's milk antibody in such cases.¹⁸ Furthermore mast cell degranulation is a prominent feature in regional enteritis¹⁹ and in both UC and CD.²⁰ Atopy has been found to be common in cases of IBD²¹ and were present in 65% of the subjects in this trial. The atopic symptoms in the five patients in the trial group all improved when foods triggering these symptoms were removed.

Chemicals in some foods may simply irritate the bowel on contact with the mucosa, as chemicals, in lotions and creams, irritate the skin in contact dermatitis. Then contact colitis would be an appropriate name, simply explaining the aetiology of UC and ED. Apples contain 243 different chemicals of which the aroma alone has 58 chemicals.²² Salicylates, benzoates, amino acids, extracted from foods that produced bowel, asthmatic and emotional symptoms, reproduced these same symptoms when fed in capsules to the patients in a double blind manner.²³ Both atopic and bowel symptoms improved in the trial group, when offending foods identified by the ED, were removed.

Each patient followed a diet according to his likes and dislikes.

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The pharmacological reaction can be due to the various vasoactive amines in foods such as histamines, monoamines, methylxanthines, tyramines and serotonin. Some may stimulate H1 receptors with increased muscular activity, increased vascular permeability and mucus gland secretions, whilst others stimulate H2 receptors with gastric acid secretion, inhibition of basophil histamine release and lymphokine release. Other amines may hasten or delay motility of the bowel and constrict or relax sphincters.²⁴

Caffeine present in tea and coffee have led to incoordination of oesophageal sphincters.²⁵ Bananas, pineapple, avocado and tomato contain serotonin. Other foods such as cheese, wine, yeast, spinach and tuna contain histamine. Some foods such as egg white, strawberry, chocolate, crustaceans, tomato and citrus fruits contain peptones and trypsin which trigger mast cell degranulation with release of histamine.²⁴ Foods triggering bowel symptoms in this trial included citrus fruits in four cases, pineapple in three cases and banana, cheese, tomato, coffee and milk in one case each. See Table 3. All these foods triggering symptoms have been shown to contain vasoactive amines or peptones which may stimulate histamine.²⁴

Some individuals may have a lowered threshold and may react to a minute amount of these amines present in foods, whilst others may react to large

amounts when eaten. This reaction may resemble similar bowel reactions associated with an IgE response, without any raised IgE levels.²⁴

Foods can influence motility of the bowel by their physical properties. Foods eaten in the natural state will contain more fibre. This leads to water absorption and easier passage of more frequent watery stools. Alternatively foods that have been milled and the fibre discarded such as refined sugar, white bread, cakes and sugared drinks will lead to less frequent, less bulky and more constipated stools.

In recent years, nutritional treatment for IBD has centred on elemental diets.⁷ These diets contain nutrients given in their simplest forms, proteins as amino acids, carbohydrates as glucose and fats as fatty acids (short chain triglycerides). In one study an elemental diet was superior to cortisone in treating patients with acute IBD.⁸ Unfortunately, elemental diets are unpalatable and require a team approach with patient, nurse, dietician and physician and, more importantly, patient compliance. The hyperosmolar solution can cause abdominal pain and needs to be introduced slowly.⁶ Polymeric diets, which contain intact proteins, were found not to be as good as elemental diets in obtaining relief in acute cases of CD who required cortisone therapy.⁷ Both diets were fed through nasogastric tubes.

The ED used in this trial may be better

Three patients were off all their drugs after three months on this diet.

Table 3:
Foods found to trigger symptoms

Fruits:	Oranges 4	Pineapple 3	Apple 1	Banana 1
Vegetables:	Green beans 2	Cabbage 2	Cucumber 1	Mushrooms 1
Proteins:	Milk 1	Cheese 1	Tomato 1	
Grains:	Maize 1	Macaroni 1	Coffee 1	
Chlorine (tap water):	1			

than elemental and polymeric diets as it identifies foods that contain the amino acids that may trigger the symptoms. Moreover, the diet is managed by one person and does not need nursing, hospitalisation, dieticians or special knowledge. This may be the reason for the 100% improvement obtained in this trial, whilst on the ED, compared to 75% improved of the elemental diet and 36% of the polymeric diet.⁷

The above trial indicates that diet is important in the adjunctive therapy of IBD and it should form part of the armamentarium of doctors treating these diseases.

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