TABLE IV—*Comparison of other relevant features of labour and delivery. Results are numbers of mothers or babies*

	PGE_2 group	Oxytocin group
Maternal		
Uterine hypertonus		
Phlebitis	2	
Diarrhoea		
Ketosis	2	1
Caesarean section	2	1
Forceps delivery	4	5
Post-partum haemorrhage	2	3
Fetal/neonatal		
Fetal distress:		
Tachycardia		1
Bradycardia	1	1
Type I dips on fetal heart monitor	3	
Type II dips on fetal heart monitor	2	3
Abnormal fetal pH		
Apgar score at 1 min (5 min):		
5–8	15 (3)	18 (5)
>8	37 (49)	34 (47)
Neonatal jaundice*	8	9

*Serum bilirubin >171 μmol/l (10 mg/100 ml).

The incidence of side effects, fetal heart irregularities, low Apgar scores, neonatal jaundice, and assisted deliveries was similar. Only two patients who received PGE_2 developed phlebitis. No patient in either group developed uterine hypertonus.

Discussion

Intravenous PGE_2 appears to be as effective as oxytocin in accelerating labour. Clegg *et al*[3] reported a significantly shorter acceleration to delivery interval when intravenous PGE_2 was used to accelerate labour, but we found that both the acceleration to delivery interval and second-stage duration were similar, irrespective of the oxytocic agent used. Cervical dilatation before acceleration of labour was irrelevant so far as the choice of oxytocic was concerned; both drugs were equally effective at different stages of cervical dilatation.

In contrast to the findings of an earlier study,[4] oxytocin showed no advantage over PGE_2 in expediting delivery in primigravidae. The instrumental delivery rate was similar, regardless of the drug used. Likewise, in multiparae both drugs proved to be equally effective.

Intravenous PGE_2 carefully administered on a dose-response titration basis seems to cause few maternal side effects. Moreover, its use for accelerating labour does not cause an increased risk to the fetus compared with oxytocin. Nevertheless, PGE_2 offers no special advantages over oxytocin when used to accelerate labour. Oxytocin is cheaper, well tried, and has proved to be as free of side effects. Consequently, we recommend its continued use for stimulating inert labour.

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Bran tablets and diverticular disease

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Summary

Three treatments for patients with symptomatic diverticular disease were compared in a crossover trial. Neither a high-roughage diet (HRD) nor Normacol plus an antispasmodic were as effective as bran tablets, which produced a significant increase in daily stool weight and a decrease in the intestinal transit time. An abnormal rapid electrical rhythm in colonic smooth muscle was found initially in 80% of the patients, but the incidence was reduced by each treatment after one month; it was present in only 40% of patients after treatment with bran tablets. Only bran significantly reduced the high percentage motility to within normal limits.

Bran proved to be the most effective treatment, not only in improving the symptoms in patients with diverticular disease but also in returning to normal the abnormal pathophysiological changes. Bran tablets were both convenient and acceptable as well as effective.

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Introduction

Many workers have associated a lack of cereal fibre in the diet with the development of diverticular disease. The initial experimental work was performed in 1949 by Carlson and Hoelzel,[1] who found that rats fed on a low-residue diet developed diverticula while those fed on a high-residue diet were unaffected. Since then much epidemiological evidence has supported this hypothesis. It has been estimated on the basis of barium enema and necropsy studies[2 3] that up to 20% of people over the age of 40, and 70% over the age of 70, in both the UK and USA have evidence of diverticular disease, whereas fewer than 12 cases have been observed in rural Africa in the last 20 years.[4-6] The most important dietary difference in these societies seems to be a considerable reduction of fibre intake and an excess of refined carbohydrate in the Western diet.[6]

Clinical improvement in patients with diverticula fed high-residue diets is now well documented,[7] but controversy still exists on the most effective form of bulk replacement.[8 9] We have compared both symptomatic and objective improvement in patients with diverticular disease using three standard regimens: a high-roughage diet with bran supplements (HRD), a bulk laxative (Normacol plus an antispasmodic), and regular large quantities of bran (in the form of bran tablets). Each bran tablet contained 2 g of bran and nine tablets were prescribed each day in divided doses. Patients taking the high-roughage diet were told which foods were high in fibre content and given a

diet sheet with this information. It was suggested that their diets should be supplemented by unprocessed bran whenever possible.

Method

Twenty patients with symptomatic diverticular disease were studied. In each case the diagnosis was established by barium enema examination. Eight of the patients had recently had an attack of acute diverticulitis and two required surgical drainage of a diverticular abscess. The following assessments were made in each subject before treatment.

Symptom score—By means of a standard questionnaire a symptom score was derived. This varied from 0, when the patient was symptom free, to a maximum of 17. Degree of pain, bowel habit, and amount of distension were all considered.

Stool weight—The average stool weight was calculated as the mean for a five-day collection and expressed as g/day.

Transit time—This was calculated by Hinton's method.[10] Twenty small radio-opaque pellets were taken by the patient and the time taken for 80% of the pellets to pass (calculated by *x*-ray examination of all the stools over five days) was regarded as the intestinal transit time.

Percentage motility—This was the percentage of recording time that pressure waves were present and was measured by means of thin open-ended tubes as described.[11] The tube was introduced into the sigmoid colon via a sigmoidoscope and recordings made for one hour at rest.

Electrical activity—The electrical activity of colonic smooth muscle was recorded by means of an intraluminal suction electrode as described.[11] The slow-wave activity (basic electrical rhythm) has a frequency in the normal sigmoid colon of 6-10 cycles/min.[11] In diverticular disease we have described the frequent occurrence of a more rapid electrical rhythm with a frequency of 12-18 cycles/min.[12] This rhythm is not seen in the normal colon. Particular note was made of the percentage of recording time that this rapid rhythm occurred. The pressure and electrical recordings were suitably amplified and recorded on an ultraviolet recorder for one hour.

All patients were then randomly allocated their treatment: half received either HRD for one month or Normacol plus an antispasmodic for one month, and half received bran tablets (Fybranta tablets) for one month. The assessments were repeated. Treatments were then crossed over and those who had taken bran initially were given either HRD or Normacol, while the others received bran for one month. The assessments were performed again.

Results

Symptom score—All patients experienced some improvement in symptoms with each treatment. Twenty per cent of patients were entirely symptom free after HRD, 40% after Normacol, and 60% after bran tablets.

Stool weight—The mean stool weight (±SE of mean) before treatment was 79±7·3 g. On both Normacol and bran tablets stool weight increased significantly after one month (see table). Bran tablets were more effective than HRD but no statistically significant difference was found in individuals between Normacol and bran tablets.

Transit time—The mean transit time before treatment was 96·6±7·1 hours, which was significantly decreased by all three treatments (see table). The bran tablets reduced the transit time to a mean 56·1 hours, which was well within the normal limits.[5] Bran tablets proved more effective in the individual patient than either Normacol ($P<0.05$) or HRD ($P<0.001$).

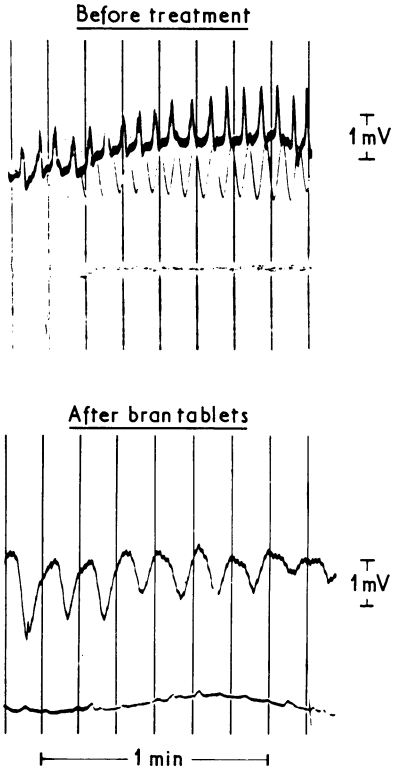
Percentage motility—In previous studies in normal subjects using thin open-ended tubes for measuring colonic motility we have found a mean percentage motility of 7·5%.[11] In the present study the mean percentage motility before treatment was 14·2±3·1%. Bran tablets reduced the intracolonic pressure activity to within normal limits (6·5%). Neither HRD nor Normacol had any statistically significant effect in reducing intracolonic pressure (see table).

Electrical activity—The rapid electrical rhythm was present in 80% of subjects before treatment. After each treatment the incidence was reduced: it occurred in 50% of patients on HRD, 60% of them on Normacol, and 40% of them on bran (see fig).

Acceptability—Nine patients preferred Normacol or HRD and 11 patients preferred the bran tablets.

Mean stool weight, intestinal transit times (passage of 80% of markers), and motility (±SE of mean) for five-day period

	Control value	HRD	Normacol	Bran tablets
Weight (g day) ..	79 ± 7·3	102 ± 15·9	105 ± 13·1	121 ± 7·1
Significance ..		NS	<0·01	<0·001
Transit time (h) ..	96·6 ± 7·1	76·4 ± 7·2	71·7 ± 10·9	56·1 ± 4·1
Significance (P) ..		<0·01	<0·02	<0·001
Motility (%)	14·2 ± 3·1	10·0 ± 2·2	14·2 ± 3·3	6·5 ± 0·8
Significance (P) ..		NS	NS	<0·02



Recording of slow wave activity (basic electrical rhythm). Top trace shows frequency of 14 cycles/min before treatment. Bottom trace shows the slow-wave frequency restored to normal after one months' treatment with bran tablets.

Discussion

Diverticular disease of the colon is one of several disorders characteristic of modern Western civilisation. A diet deficient in cereal fibre is generally regarded as the predisposing chief factor.[4] This low-residue diet results in increased segmentation within the colon, with the eventual development of considerable circular muscle thickening characteristic of diverticular disease. Any assessment of improvement must be concerned with these basic changes.

We measured both direct and indirect indices of improvement. The former were the changes in intracolonic pressure and smooth muscle electrical activity. Some workers claim a raised basal intracolonic pressure in segments of colon with diverticula,[13] whereas others have shown a rise only in response to various forms of stimuli—for example, food and neostigmine.[14] In this study we have shown that patients with diverticular disease have a higher basal intracolonic pressure than normal subjects.[11] This may be accounted for because all patients had definite symptoms, and eight had recently had an acute attack of diverticulitis. Of the three treatments studied only bran reduced the abnormal intracolonic pressure to within normal limits.

With regard to the slow-wave electrical activity (basic electrical rhythm) we have previously reported an abnormally rapid rhythm in a high proportion of patients with diverticular disease; this presumably further reflects hypertrophied circular

muscle activity. All the three treatments restored the normal myoelectrical activity to a greater or lesser extent but bran was most effective. Indirect indices of colonic function were stool weight and transit time. The reduced stool weight and the prolonged intestinal transit time found in diverticular disease were both significantly changed by all three treatments, with the bran appearing most effective.

These results suggest that in diverticular disease all indices of colonic pathophysiology can be restored to normal, which supports the theory that diverticular disease results from a normal colon being subjected to abnormal dietary stress rather than from a primary or constitutional colonic abnormality. Although controversy exists on how best the bulk should be replaced,[9] there seems to be no adequate replacement for substantial amounts of bran. Its unpalatability has resulted in the use of several substitutes—for example, bulk laxatives—but these do not appear to be as effective either in reducing symptoms or in restoring the normal myoelectrical activity. We have found that bran compressed in the form of tablets is not only convenient and acceptable but also effective. We have prescribed nine tablets a day (18 g bran) as the standard treatment but this may be varied in response to the patient's symptoms.

We thank Norgine Ltd for the kind gift of bran tablets (Fybranta Tablets).

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Once-daily dosing with atenolol in patients with mild or moderate hypertension

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Summary

Because of the difficulties patients have in adhering to their drug regimens a trial was performed in which patients with essential hypertension were given, in random order and for four weeks each, three different doses of atenolol to be taken once daily. Atenolol effectively decreased lying and standing blood pressures, and there was no difference between the effects of the three doses. The simplicity of the regimen, as well as atenolol's freedom from troublesome side effects, should be valuable in helping patients adhere to long-term treatment.

Introduction

Atenolol (Tenormin, ICI 66 082) is a new beta-adrenergic blocking agent which is equipotent with propranolol in suppressing exercise tachycardia.[1] Animal experiments have shown that atenolol has cardioselectivity and an absence of both intrinsic sympathomimetic activity and membrane stabilising activity and that it does not cross the blood-brain barrier. It has a plasma half life in man of about eight hours.[2] Initial clinical studies have indicated that atenolol, when administered two or three times daily, is effective in the treatment of hypertension.[3-5]

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Patient compliance in adhering to long-term oral treatment has been much debated. It is likely to be poor if the patient is asymptomatic, as in the case of many hypertensive subjects, or if the dosage is complicated or has side effects.[7-9] Although there have been relatively few troublesome side effects associated with twice-daily doses of atenolol,[5 6] the problem of patient compliance remains, and as patients probably comply best with once-daily dosages we investigated the effect of atenolol once a day in patients with mild or moderate hypertension.

Patients and methods

We studied 18 patients who all had newly diagnosed essential hypertension. The six men were aged 54 to 61 years (mean age 55 years) and the 12 women 34 to 63 (mean age 51 years). The patients were selected at the end of a four-week placebo run-in period if their diastolic blood pressure after five minutes' rest in the supine position was (*a*) 100-120 mm Hg if 54 years or less or (*b*) 105-125 mm Hg if 55 and 65 years. We excluded patients with a history of congestive cardiac failure (CCF), asthma, or electrocardiographic evidence of second or third degree heart block and those who were pregnant. Patients who developed CCF, asthma, symptomatic bradycardia, high blood pressure requiring urgent treatment (diastolic pressure of 130 mm Hg or more), or side effects which proved intolerable were withdrawn from the study.

The study was double-blind, within-patient (crossover), and randomised. After a four-week placebo run-in period, the patient began active treatment provided his blood pressure conformed with the criteria set out above. The treatment comprised three randomly allocated four-week periods when either 50 mg (25 mg × 2), 100 mg (50 mg × 2), or 200 mg (100 mg × 2) of atenolol was taken in a single dose with the evening meal. Placebo and 25-mg, 50-mg, and 100-mg tablets of atenolol all looked alike.

All the patients were seen each fortnight (between 6-7 pm) and were instructed not to take the evening dose before the day of the visit to the surgery, so that a blood pressure at least 24 hours remote from the previous dose could be obtained. At each visit a resting pulse