Duodenal Ulceration in Indians and Blacks in Durban

J. V. ROBBS, M. G. MOSHAL

**SUMMARY**

Duodenal ulceration among Black and Indian patients admitted to King Edward VIII Hospital, Durban, over a 26-year period (1950 - 1976) was studied. Analysis was made over a series of time intervals within this period, and expressed as the number of admissions for duodenal ulcer per 1 000 total admissions (excluding obstetric and gynaecological patients).

Admissions for duodenal ulceration increased 2,4-fold among the Indians and 11,9-fold among the Blacks from 1950 to 1976. The disease appears to have become commoner among women in both race groups. The peak age for Indian men is the 3rd decade, but for Indian women the peak age incidence has changed from the 4th to the 6th decade. There is now a peak in the 3rd decade for Black men, compared with the 4th decade, as reported 20 years ago. The pattern is similar in Black women.

Clinical presentation is similar in the two groups, although it is significant that haemorrhage occurs more frequently among the Black patients.


Interest in the prevalence of duodenal ulceration in Black populations south of the Sahara has recently been stimulated. Durban, South Africa, was regarded as an area of extremely low prevalence of duodenal ulceration, according to data provided by Kark. This has prompted a reappraisal of the problem, in an attempt to establish whether the incidence of duodenal ulceration is increasing, whether the clinical pattern of presentation is changing, and whether any aetiological factors can be postulated for whatever changes may have occurred.

King Edward VIII Hospital, Durban, is the major referral centre for Zulu and Indian patients from Durban and its environs, the KwaZulu homeland, and the coastal areas of Natal. It thus serves a population of 2,5 million.

**METHODS**

An analysis has been made of all hospital admissions (excluding patients admitted for obstetric and gynaecological treatment) for duodenal ulceration in the period 1950 - 1975. Those who presented investigative or therapeutic problems, and those for whom surgery was indicated, were studied. Analysis has been made over a series of time intervals to demonstrate the changing incidence of the disease. During these time intervals there was no change in the criteria for hospital admission. The number of doctors at the hospital and the number of beds available for both men and women remained the same, and the number and referring habits of the referring practitioners were unchanged. The duodenoscope was not used until 1972 at King Edward VIII Hospital, and therefore the ulcers were diagnosed by clinical findings, contrast radiology, or surgery.

**RESULTS**

There has been a progressively increasing number of Indian and Black patients admitted to hospital with duodenal ulceration (Table I). During the period 1950 - 1959 550 out of 65 000 Indians (8.5/1 000) with duodenal ulceration were admitted. The numbers rose steadily in the intervening years, and during the period 1972 - 1975, the incidence rose to 24 duodenal ulcer patients per 1 000 admissions (a 2.8-fold increase).

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of duodenal ulcers</th>
<th>Total admissions</th>
<th>Number per 1 000 admissions</th>
<th>Sex ratio M : F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indians</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950 - 59</td>
<td>550</td>
<td>65 000</td>
<td>8.5</td>
<td>7.3 : 1</td>
</tr>
<tr>
<td>1960 - 62</td>
<td>275</td>
<td>28 062</td>
<td>9.8</td>
<td>7.4 : 1</td>
</tr>
<tr>
<td>1963 - 65</td>
<td>379</td>
<td>28 608</td>
<td>13.3</td>
<td>5.6 : 1</td>
</tr>
<tr>
<td>1966 - 68</td>
<td>497</td>
<td>28 410</td>
<td>17.5</td>
<td>3.9 : 1</td>
</tr>
<tr>
<td>1969 - 71</td>
<td>437</td>
<td>22 367</td>
<td>19.5</td>
<td>3.4 : 1</td>
</tr>
<tr>
<td>1972 - 75</td>
<td>348</td>
<td>14 514</td>
<td>24.0</td>
<td>2.7 : 1</td>
</tr>
<tr>
<td>Blacks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950 - 59</td>
<td>88</td>
<td>361 000</td>
<td>0.2</td>
<td>6.8 : 1</td>
</tr>
<tr>
<td>1960 - 62</td>
<td>53</td>
<td>121 711</td>
<td>0.4</td>
<td>2.5 : 1</td>
</tr>
<tr>
<td>1963 - 65</td>
<td>81</td>
<td>109 883</td>
<td>0.7</td>
<td>4.0 : 1</td>
</tr>
<tr>
<td>1966 - 68</td>
<td>135</td>
<td>102 554</td>
<td>1.3</td>
<td>2.8 : 1</td>
</tr>
<tr>
<td>1969 - 71</td>
<td>245</td>
<td>97 591</td>
<td>2.5</td>
<td>2.5 : 1</td>
</tr>
<tr>
<td>1972 - 75</td>
<td>369</td>
<td>128 361</td>
<td>2.9</td>
<td>2.8 : 1</td>
</tr>
</tbody>
</table>

Eighty-eight of 361 000 Black patients admitted (0.24/1 000) were diagnosed as having duodenal ulceration during the period 1950 - 1959. The numbers rose steadily, and during 1972 - 1975, 128 361 Blacks were admitted, 369 of whom had duodenal ulceration, i.e. 2.9/1 000 patients admitted (a 12-fold increase).

The sex distribution in the two race groups is shown in Table I. Indians showed a male : female ratio of 7.3 : 1 during 1950 - 1959. The ratio had progressively dropped to 2.7 : 1 for the period 1972 - 1975.

Black patients presented in a ratio of 6.8 men to every woman during 1950 - 1959. Between 1960 and 1962 there appeared to be a fairly rapid drop to a ratio of 2.5 men to every woman, which has remained fairly constant to the present time (1972 - 1975: 2.8 : 1).
decade of life, and then gradually levelled off over the next 4 decades to an occurrence of 0.2% in the 70-79-year age group.

The age distribution in Indian women during the 3rd (25%), 4th (27.3%) and 5th (23.3%) decades remained even during the period 1950-1959, with a slightly higher occurrence during the 4th decade.

The pattern was similar among Indian men during 1974-1976, but there was a far less definite peak in the 3rd decade (32.1%), and a greater proportion of duodenal ulcers developed during the 4th decade (28.5%).

For the period 1974-1976, there was a similar even distribution among Indian women during the 3rd (25%), 4th (27.3%) and 5th (23.3%) decades, but it is notable that the highest incidence was in the 50-59-year age group (23.5%). There was also a marked increase in occurrence during the 7th (7.1%) and 8th (3.5%) decades, compared with the period 1950-1959.

During 1950-1959, the peak for Black men occurred during the 4th decade (35.3%), with similar figures for the 3rd and 5th decades (22.0%). In Black women the peak incidence was during the 6th decade (33.0%).

During 1974-1976 there was a definite peak in the 4th decade (40.5%) for Black women, with a sharp decline during the 5th decade (29.7%), and a fairly even distribution during the preceding and following 10-year periods.

Detailed prospective records have been kept on 306 Indians and 109 Black patients who have attended a duodenal ulcer clinic at the Gastro-intestinal Unit at King Edward VIII Hospital over the last 21 years. All duodenal ulcers were detected by endoscopy. There was a slightly higher proportion of men among Indian patients, who had a male: female ratio of 2.6:1 (72.2% men), compared with 1.8:1 (64% men) among Black patients (Table II).

<p>| TABLE II. MAJOR PRESENTING SYMPTOMS IN 109 BLACK AND 306 INDIAN PATIENTS WITH DUODENAL ULCERS |</p>
<table>
<thead>
<tr>
<th>Presenting symptoms</th>
<th>Black</th>
<th>Indian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspepsia</td>
<td>98</td>
<td>295</td>
</tr>
<tr>
<td>Perforation</td>
<td>15</td>
<td>43</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Stenosis</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Associated gastric ulcer</td>
<td>8</td>
<td>15</td>
</tr>
</tbody>
</table>

* P<0.05.

Adequate information regarding ages is available for the periods 1950-1959 and 1974-1976 (Figs 1 and 2).

During the period 1950-1959, 47.5% of Indian men with duodenal ulceration were within the 20-29-year age group. The occurrence fell to 21.6% during the following decade of life, and then gradually levelled off over the next 4 decades to an occurrence of 0.2% in the 70-79-year age group.

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The pattern of clinical presentation is shown in Table II. It can be seen that severe dyspepsia was a major symptom that prompted hospital attendance, and was experienced by many patients who presented with complications. The complications of duodenal ulcer, such as perforation, occurred with almost equal frequency among Blacks (15 patients — 13.8%) and Indians (43 patients — 14.4%).

Haemorrhage was significantly more common among
Blacks (23 patients — 21.1%) than Indians (17 patients — 5.6% \((P<0.05)\). Gastric outlet obstruction was more frequent among Blacks (9 patients — 8.3%), but the difference was not significant compared with the percentage for Indians (15 patients — 4.9%). Similar incidence differences were noted when the occurrence of gastric ulceration complicating duodenal ulcer was compared (Blacks: 8 patients — 7.3%; Indians: 15 patients — 4.9%).

Adequate information on socio-economic background was obtained from 220 Indian and 75 Black patients. There is no evidence that the standard of living or education had changed materially during the study periods. The majority (62.7%) of Black patients were employed in unskilled jobs, compared with 47.8% of Indians. There are more semiskilled and skilled workers among Indians (45.9%) than among Black patients (25.3%). There were similar proportions of university students (Indians 3.6%: Blacks 2.7%). Nine per cent of the Black patients were trained in professions such as teaching or medicine, compared with 2.7% of Indians.

Twenty of the Black patients (18.3%) were referred from the rural areas. Eight of them (40%) had an indication for emergency or elective surgery. Three had intractable symptoms which failed to respond to controlled drug therapy in hospital. Two presented with gastric outlet obstruction, 1 had had recurrent haemorrhage and 2 were admitted with subacute perforation. In an attempt to ascertain whether deviation from traditional dietary habits had any part to play in the aetiology of duodenal ulceration, a sample of 21 consecutive Black patients and 41 Indian patients completed a questionnaire on the major constituents of their respective diets. This type of study is known to be fraught with difficulties, and the numbers were too small for any definitive statement. The traditional diet of Blacks has a high fibre content, consisting mainly of unrefined maize, broad beans, and meat, when obtainable. Green vegetables were not regularly eaten by the Black patients who completed the questionnaire. Refined carbohydrate was the major constituent in their diet. The standard luncheon fare was invariably plain white bread and a 750-ml bottle of a popular carbonated, caffeinated soft drink which has an extremely low pH. Moderate consumption of tea with liberal quantities of refined sugar was the rule. Milk was not consumed in any great quantity. Fourteen per cent admitted to a heavy intake of traditional sorghum beer, but many more consumed some quantity of alcohol, and 19% were regular smokers.

All the Indians questioned consumed a diet consisting mainly of refined carbohydrate, including refined rice, frequently eaten with meat. All meals were curried, with liberal use of spices. Tea or coffee was taken in moderation by all patients questioned, and milk was not a major constituent of the daily food intake. Thirty-nine per cent were heavy consumers of alcoholic beverages, usually in the form of pure cane spirit, and 53.7% regularly smoked cigarettes.

**DISCUSSION**

Duodenal ulceration has generally been regarded as a rare disease among the Black population in South Africa. In the earliest published investigation it was reported that 3 duodenal ulcers were found among 18 000 Blacks admitted to a Johannesburg hospital between 1921 and 1926. After this study, during the next decade, only 8 peptic ulcers were found during 8 328 medicolegal autopsies. The same authors found 5 peptic ulcers during 1 144 hospital autopsies.

Between 1943 and 1948 Charlewood and Frylinck reported an incidence of 0.9 cases of peptic ulceration per 1 000 hospital admissions among Johannesburg Blacks. In Cape Town, in a series of 356 consecutive cases of gastro-duodenal ulceration among Whites and Blacks, only 3 ulcers (all duodenal) were found in Black patients.

McKenzie found an incidence of peptic ulcer of 0.68/1 000 among Zulus admitted to hospital in Durban. Of the 27 ulcers that he studied over a 2-year period, 22 were in the first part of the duodenum. In a larger study at King Edward VIII Hospital, Durban, between 1950 and 1959, a total peptic ulcer incidence of 0.28/1 000 admissions was found among Blacks. If duodenal ulceration alone is considered, the incidence fell to 0.2/1 000 admissions. Our study shows that over the course of the following 16 years, there has been almost a 12-fold increase in incidence to a level of 2.0/1 000. In 1972, Bremner reported that the incidence of duodenal ulcer was rising in the Johannesburg urban Black. Recently Segal et al. from Johannesburg reported an incidence of 4.5/1 000 in Blacks admitted to hospital, which also suggests a rising incidence in that area.

The South African Indian population has not been studied as comprehensively as the Black population. Esser and Coetzee reported 9.64/1 000 admissions for all forms of peptic ulceration. Kark found an incidence of 10/1 000, 8.5 of which were duodenal ulcers. A 2.4-fold increase has occurred during the last 16 years, to reach a level of 24.0/1 000 admissions in the present series.

According to the criteria of Tovey and Tunstall regarding the incidence of duodenal ulceration in Blacks in Africa south of the Sahara, Durban may now be regarded as an area of high prevalence (more than 10/1 000 admissions), in which the disease constitutes a major problem among the Indian population. As regards the Black population, Durban has risen from an area of extremely low prevalence to an area of moderate prevalence (1-10 cases per 1 000 admissions).

Previous authors have indicated the rarity of duodenal ulceration among Black women, the male:female ratio having ranged from 12.5:1 to 6.8:1. Our study shows that there has been a marked drop in the male:female ratio in the last 16 years, from 6.8:1 between 1950 and 1959, to the present level of 2.8:1. It is possible that the increasing emancipation of Black women has played a role in this increase.

A similar change has occurred among Indians, the ratio having dropped from 7.3 men to every woman between 1950 and 1959, to 2.7:1 at present. For both these population groups in Natal the figures are similar to those quoted for Whites in South Africa (3.6 men to every woman) and Britain (1.9 men to every woman).

The peak age incidence for duodenal ulceration in the UK is between 45 and 55 years. McKenzie indicated that
the disease tended to occur far earlier in Blacks than in Whites. During the period 1950-1959 Kark showed a peak incidence in the 4th decade among Black men, and in the 3rd decade among Indian men. Among Indian women the peak was a decade later. There were too few Black women patients for meaningful analysis. When these figures are compared with those found over the period 1974-1976, the peak age incidence occurred a decade earlier in Black men (20 to 29 years), and equalled that of Indian men, for whom the peak age incidence remained unchanged. The pattern among Indian women remained essentially unchanged, but in Black women the disease tended to occur a decade later than in the men.

It seems that these findings are similar to those reported from elsewhere in Africa and in India, where duodenal ulcer tends to occur in a far younger age group than that in which it is found in Britain.

Among the Blacks in this series, half (50.4%) had a complication of duodenal ulceration such as haemorrhage, perforation, stenosis or associated gastric ulceration. The commonest single complication was haemorrhage, perforation having occurred slightly less frequently. Gastric outlet obstruction was relatively uncommon. This experience is similar to those previously reported in this country. The findings differ from those usually reported from rural Africa in which haemorrhage and perforation are rare, and stenosis is the commonest presenting feature.

Segal et al. described the clinical presentation of 13 Black patients in Johannesburg with a characteristic syndrome related to giant duodenal ulcer. We have not encountered this problem among our patients, although duodenoscopy has been used since 1972.

Twenty-nine per cent of Durban Indians with duodenal ulceration had complications, of which perforation was the commonest.

Haemorrhage, stenosis and concomitant gastric ulcer were relatively uncommon. The lower incidence of haemorrhage is statistically significant when compared with that in Blacks. The clinical pattern of duodenal ulceration among the Black and Indian population in Durban has not changed since the study done in 1961.

Increasing urbanization of the Black population may be a factor in the increase of admissions for duodenal ulceration. Only 18.3% of the prospectively studied group in this series are truly rural people. Communication with the large peripheral hospitals in rural Natal, in Ladysmith and in Nqutu, KwaZulu, indicates that duodenal ulcers are rarely seen in these areas, either in cases of emergency or as elective diagnostic problems. Fewer than 15 patients have been admitted to either hospital with duodenal ulceration during the last 5 years. In addition, these patients are usually eventually referred to King Edward VIII Hospital for further investigation and elective treatment.

Many of the Blacks questioned about their dietary habits consumed a diet consisting mainly of refined carbohydrate, meat and vegetables. Those from rural areas adhered to the traditional high-fibre diet of unrefined carbohydrate in the form of maize, meat and milk. The use of alcohol and tobacco was widespread, but did not appear to be excessive in most cases.

The major difference in dietary habits between rural and urban Blacks is the relatively high proportion of highly-refined carbohydrate eaten by the latter. Cleave has postulated that this reduces protein buffer content in the upper gastro-intestinal tract, and hence predisposes to duodenal ulceration.

It may be that dietary factors play some part in the increasing incidence of duodenal ulceration among Durban Blacks. However, increasing stresses and responsibilities that accompany better job opportunities, and the rapidly increasing exposure of an essentially rural people to the pressures and hurly-burly of city life may also be important.

Little has changed for the Indian population, either logistically or with regard to dietary habits over the last 10-20 years, and it is difficult to explain the apparent increase in incidence of duodenal ulceration in this population group over the same period.

REFERENCES

1. Tovey, F. L. and Tunstall, M. (1975): Gut, 16, 564.