THE PATTERN OF CERTAIN GASTRO-INTESTINAL DISEASES IN INDIA

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The incidence and clinical pattern of diseases differ in different parts of the world and even vary from area to area in the same country. Several factors contribute to these differences. Racial and hereditary factors, climatic conditions, socio-economical factors, dietetic habits and mode of living are some of the important factors involved in the genesis of these variations.

The pattern of gastro-intestinal disease in India differs considerably from that of the Western World. Some of the gastro-intestinal conditions which are common in India are rarely seen in Western countries and vice versa. This review will be concerned primarily with the differences in patterns of the more common gastro-intestinal conditions.

Peptic Ulcer

It is doubtful if the claim that peptic ulcer is a disease of modern civilization is correct. Its incidence^{10a, b, c, 14} has been reported from the remote parts of Africa and India where the influence of modern civilization could hardly be seen. Peptic ulcer is distributed unevenly throughout India. Several authors^{10a, b, c, 18, 19} have reported that the incidence is highest in the South. The incidence in different parts of the country is shown in Table 1 and Fig. 1.

TABLE 1

SHOWING INCIDENCE OF PEPTIC ULCER IN DIFFERENT PARTS OF INDIA BASED ON DOGRA'S^{10a, b, c} WORK AND ADAPTED FROM KONSTAM'S ARTICLE

Area	Population, 1931	No. of Cases	Incidence per 100,000 Population
Assam ..	9,247,857	926	10
Bengal ..	51,087,338	16,976	33
Bihar ..	23,676,028	8,851	37
Bombay ..	26,398,997	2,099	7
Punjab ..	23,580,852	2,131	9
Madhya Pradesh	17,990,937	2,327	12
United Provinces	49,614,833	4,460	11
Madras ..	46,760,028	57,397	143
Orissa ..	18,653,555	4,132	29

The incidence of peptic ulcer is highest in coastal areas. This area along the coast is often described as the peptic ulcer belt. The maximum incidence is in the South-West coastal areas followed by South-East and Eastern coastal areas. West coast areas are conspicuous in their low incidence. A small strip of area (Coimbatore district) in the South between the two coastal areas of heavy incidence have a significantly low incidence. The central and northern plains of the country are relatively free from the disease.

The highest incidence of peptic ulcer is between the ages of 20 and 35 years. The mean age for peptic ulcer is reported to be 31 years for males and 25 years for females, gastric ulcer occurring more in younger age groups than duodenal ulcer.⁶

In spite of keeping in mind the smaller attendance and fewer beds for women in hospital, one is still impressed by the relative rarity of peptic ulcer in females, the ratio of males to females being 8 : 1. Incidence is higher in Hindus than Moslems.^{6, 19} There is fair evidence that poor communities have a higher incidence of peptic ulcer than the well-to-do classes.^{6, 10a, b, c, 15}

Agreement is lacking on the relative incidence of gastric ulcer to duodenal ulcer. However, all authors agree on higher incidence of duodenal ulcer. Table 2 shows the ratio of G.U. : D.U. as reported by various authors.

It is suggested that two types of peptic ulcer exist in India differing in aetiology, clinical features and prognosis.¹⁵ For want of proper

TABLE 2

SHOWING RATIO OF INCIDENCE OF DUODENAL ULCER TO GASTRIC ULCER IN DIFFERENT PARTS OF INDIA

Author	Area	Ratio of D.U. : G.U.
Menon ¹⁸	South India	20 : 1
Sommervell ²⁵	Travancore	36.7 : 1
Dogra ¹⁰	Madras	48 : 1
Dogra ¹⁰	South India	24 : 1
Antia ²	Bombay	8.7 : 1
Chatterjee ⁶	Bengal	11.1 : 1
Narsingh Rao ¹⁹	Calcutta	6.5 : 1

FIG. 1

terminology we would call them the tropical type and the Western type. The tropical type is the most prevalent form of the disease. It seems to be primarily a disease of poor communities residing in rural areas near the coast and whose diets are poor in quality. Clinically the disease is characterized by chronicity and its tendency to fibrosis and stenosis. It is the experience of the surgeons in the South that major complications like perforation and haemorrhage are rarely met in these patients, whereas fibrosis and stenosis are frequently observed. This is in sharp contrast to reported complication rates from many Western countries. In central, northern and western areas, the clinical picture of peptic ulcer is very like that observed in Western countries. All social classes are reported to be involved and haemorrhage and perforation are the most frequent complications.

Several factors have been suggested in causation of peptic ulcer in India. Nissen²⁰ and Konstam¹⁵ believe that protein deficiency is the causative factor. Sommervell²⁵ has suggested that deficiency of vitamins and particularly Vitamin A

and B₂ are responsible factors. Ogilvie²¹ considered chillies (red pepper) to be the most probable cause of peptic ulcer.

It is not clear how far protein malnutrition exists in India. Average protein requirement for Indians is estimated to be 45 g., whereas average intake is 63 g. Food is grossly deficient in animal proteins, average intake being 10 g. Kwashiorkor is infrequently seen amongst children but very rarely amongst adults.¹¹ People residing in the peptic ulcer belt are poor and their diet is more likely to be inadequate. Fig. 1 shows various food habits of different areas. The staple diet of people in the coastal areas is rice. People of the South-East eat more spices. These facts point in favour of malnutrition and spices being causative factors. However, similar conditions exist in many other parts of the country where the incidence is low; for example people residing in West Coast areas also eat mainly rice and indulge freely in spices yet they suffer infrequently from peptic ulcer. The low incidence of peptic ulcer in areas where the staple diet is wheat, and meat is consumed more freely, is impressive. Peptic ulcer is reported to be un-

known amongst the fishermen of the South whose diet is fairly adequate in proteins.²⁵ The low incidence of the disease in Coimbatore is attributed to the higher consumption of milk in that area.

Because of the higher incidence of hookworm infection in the South, this is often considered a responsible factor in the genesis of duodenal ulcer. Chandler^{8, 9} reported a parallelism between ulcer incidence and hookworm infection but others have been unable to find a higher incidence of duodenal ulcer in areas where hookworm is especially prevalent.

Primary Malabsorption Syndrome

There is fair evidence that the indigenous population suffer from tropical sprue. Clinically the disease tends to be of a milder and more chronic nature in Indians than in foreigners suffering from it. The disease is widely distributed throughout the country. The true incidence in different parts is not known but the incidence in army units stationed in different parts suggest it is higher in Assam, Bengal and Bihar.^{12, 13, 16} Southern and Western regions follow them. The incidence is lowest in North and Central India. The areas where sprue is common are the areas of higher humidity and heavy rainfall.^{12, 13} The incidence of sprue is maximum in summer and monsoon months, namely between March and September, a period during which the incidence of dysentery and malaria is also high. The distribution of sprue and its seasonal incidence overlap those of dysentery. As a result of this and the high percentage of people suffering from both the diseases, several authors have tried to link the two. Manson Bahr¹⁷ found a history of dysentery in 40 per cent. of his sprue cases. Keele and Bound¹³ reported that there is no relation between the two diseases. Malaria is thought by some authors to exaggerate the sprue syndrome. Recent control of malaria should provide an answer to this problematic relationship.

There is fair evidence in favour of the infection theory of tropical sprue. The incidence of tropical sprue is highest during the period when flies breed. It is a common experience that change of house or locality or town results in a spontaneous cure. Certain towns, areas and even houses are notoriously known as 'sprue-areas', as people staying in these areas often suffer from the disease. Further, it is the experience of many physicians that chemotherapeutic drugs used in treatment of dysentery help patients with sprue.

Low protein intake is yet another factor in the causation of tropical sprue.²⁶ This has been supported by the finding that sprue is common

amongst vegetarians. There is no conclusive evidence in favour of this view.

Clinically the disease tends to be milder in the local population. The full-blown picture of sprue as seen in a foreigner is rarely met with. This, coupled with a higher incidence of chronic amoebiasis, makes diagnosis difficult. The disease has a tendency to natural remissions and relapses.

The exact incidence of non-tropical sprue in India is not known. It is believed that its incidence is substantially lower than that in Western countries. Obviously a few cases of non-tropical sprue must be mistaken for tropical sprue.

Abdominal Tuberculosis

This is a fairly common condition. Glandular, peritoneal and intestinal varieties are all met with. Generally these conditions are secondary complications of a primary lung lesion. Its incidence used to be as high as 95 per cent. in advanced cases of pulmonary tuberculosis but recent years have seen a steady decline. The commonest secondary form of tuberculosis is the ulcerative type of intestinal lesion.

It is disputed if primary tuberculosis of the intestine exists. Some authors feel that there is nothing like primary tuberculosis of intestines and such cases are variants of Crohn's disease. Even after applying the strictest criteria of diagnosis, namely presence of tubercle bacilli and/or positive animal inoculation, there is substantial evidence^{1, 3, 23} to suggest that primary tuberculosis of the intestine is a definite entity. Ukil and Tribedi found a post-mortem incidence of about 5 per cent. of primary intestinal tuberculosis. Several authors^{1, 3, 23} have described well-proved cases of primary disease.

The human strain of tubercle bacilli is thought to be responsible for this type of lesion. Ukil²⁸ and Anand¹ found the human strain in all their cases of intestinal tuberculosis. The habit of spitting and the use of ash and earth to clean utensils accounts for this higher incidence of infection with the human strain. Milk is generally boiled before using, which explains the absence of infection with the bovine strain.

Clinically these cases are mostly of the hypertrophic variety and rarely of ulcerative type. Ileo-caecal is the commonest site of involvement but occasionally other parts of the intestinal tract may be involved. Pain in the abdomen, low fever, loss of weight, diarrhoea or constipation, anorexia, haemorrhage and flatulent dyspepsia are the commonest symptoms. Locally, a tender mass is felt in large numbers of patients.

The clinical picture is very akin to that of Crohn's disease and mistakes in diagnosis on either side are likely to occur. Even histology is not

reliable as shown by Banerjee³ who found the picture of tubercle granuloma changing to chronic granuloma very similar to that seen in Crohn's disease, on exhibition of anti-tubercular treatment. Anand¹ has shown that in some cases typical changes of tuberculosis may not be seen in the intestine but may be evident in lymph nodes.

The clinical course of hypertrophic tuberculosis is quite distinct from that of Crohn's. Most of the cases recover completely with successful treatment or deteriorate and succumb to it. Remissions and relapses are not commonly seen. Crohn's disease is characterized by natural remissions and post-operative relapses. Unlike Crohn's, obstructive complications are frequent whereas fistulae are extremely rare.

Peritoneal tuberculosis is a common condition and is manifested in two varieties; namely ascitic and fibro-caseous.

Although the true incidence of Crohn's disease is not known, it is considered to be an extremely rare condition in India.

Dysentery

Amoebiasis is the biggest gastro-intestinal problem in India. The incidence is high. Reports^{22, 24} suggest that 20 to 43 per cent. of the healthy population are cyst carriers; 35 to 58 per cent. of patients with abdominal complaints show the presence of amoebae or cysts in their stools. It would be no exaggeration to say that the average person in India has suffered, is suffering or will suffer from amoebiasis. Fig. 2 depicts the various types and course of the disease. Chronic dysentery is the commonest type met in practice. The unfortunate sufferer is never completely free from the disease and gets exacerbations from time to time. The morbidity rate is high; complete cure a rarity.

Endameba Histolytica is often a causative organism of appendicitis. This type of appendicitis responds promptly to anti-amoebic treatment. Occasionally manifestations of acute abdomen may be present in a fulminating case. Perforation and peritonitis are rare complications.

Chronic granuloma of caecum and rectum due to amoebic infection is occasionally met with and needs to be differentiated from malignancy and tuberculosis of these organs.

Amoebic hepatitis is the commonest complication. An autopsy survey suggested that 39 per cent. of patients dying with intestinal amoebic lesions have liver involvement; 5 to 10 per cent. of people with amoebic dysentery are reported to develop hepatitis; 20 to 30 per cent. of patients with amoebic hepatitis may not give any history of dysentery or may not show any evidence of intestinal involvement.

FIG. 2.

The post-dysenteric syndrome is a common sequel of amoebic dysentery. It is manifested by recurrent abdominal pain, persistent diarrhoea and the passage of mucus. Abuse of drugs and psychological factors are considered to play an important role in its genesis.

Both acute and chronic bacillary dysentery are widespread throughout the country and claim a high percentage of mortality and morbidity.

Ulcerative Colitis

In contrast to specific colitis, ulcerative colitis is a rarity. Undoubtedly a few of the chronic dysentery cases must be ulcerative colitis.

Intestinal Parasites

Intestinal parasitic infestation is common and forms a problem second to amoebiasis in incidence and diversity of abdominal complaints.

Ascaris lumbricoides and *Enterobium vermicularis* are the commonest parasitic infestations. Children are more prone to these infestations. Infestation with *ascaris*, *enterobius*, *trichuris* and *ankylostomiasis* are cosmopolitan in their distribution. *Trichinella* and *Taenia solium* infestation are seen in non-Moslems, whereas infestation with *Taenia saginata* is seen amongst non-Hindus due to particular food habits. Infestation with *Taenia echinococcus* occurs occasionally. Schistosomiasis and liver flukes are extremely rare and are localized to small zones. Hook-worm is reported to be very prevalent in the South. It declines in Eastern and Northern regions.^{8, 9, 22}

Giardiasis is widely spread and the organism is commonly found in stools. According to Shrivastava²⁴ 11.5 per cent. of healthy population show the presence of giardia in their stools, whereas 21.5 per cent. of people with abdominal complaints have these parasites. Their pathogenicity is disputed but it is believed by many physicians that they are often responsible for symptoms such as flatulent dyspepsia, upper abdominal pain, diarrhoea, steatorrhoea, urticaria, nervousness and dysentery.

Portal Cirrhosis

Portal cirrhosis is widely prevalent in India. The clinical picture is very much that of the post-

necrotic variety, though wasting and malnourishment are marked associated features. In more than 60 per cent. of patients it is difficult to ascertain a cause for their cirrhosis. They have never been jaundiced, give no history of hepatitis and have not been taking alcohol in any significant quantity. Malnutrition and parasitic infestations are blamed for the cirrhosis. Recent work on Kwashiorkor in India and elsewhere has seriously thrown doubts on protein deficiency as a cause of cirrhosis. The prognosis of the Indian cirrhotic is poorer than his counterpart in Western countries and few patients survive more than two years. Malnutrition and parasitic infections may be factors contributing to the adverse prognosis.

Infantile Cirrhosis

Infantile cirrhosis is a peculiar disease of India. The disease is widely spread but is heaviest in the South. Children of middle-class Hindu families between 6 months and 2 years are usually affected. The disease is characterized by an acute phase during which the child becomes ill, runs a mild fever and develops hepato-splenomegaly. Jaundice, ascites and oedema follow in due course. A small percentage of cases deteriorate rapidly, becoming cholaemic in two to four weeks and succumbing to it. But a large percentage progresses to a chronic stage which ultimately ends in cirrhosis. Pathologically the disease is characterized by obliterative lesions of terminal and some of the bigger divisions of hepatic venous trees, necrosis of liver cells with poor attempt at regeneration and connective tissue proliferation.

Protein malnutrition, virus infection and intestinal toxæmia have been suggested as aetiological factors. The clinical and pathological picture is very much like that of veno-occlusive disease with the major differences that the former involves only children and in the majority of cases no plant extracts could be held responsible.

Summary

The incidence and clinical picture of gastro-intestinal diseases in India differ considerably from those in other parts of the world. An attempt has been made to describe some of these differences and discuss the local factors in aetiology and prognosis. Some problems of gastro-intestinal disease have been outlined.

REFERENCES

1. ANAND, S. S. (1956), *Ann. roy. Coll. Surg. Engl.*, **19**, 205.
2. ANTIA, F. P., BHATNAGA, S. M., and VYAS, M. C., 'Proceedings of World Congress of Gastro-Enterology', Baltimore: The Williams and Wilkins Co.
3. BANERJEE, B. N. (1950), *Indian J. Surg.*, **12**, 33.
4. BRAMWELL-COOK, A. (1944), *Indian med. Gaz.*, **79**, 429.
5. BOCKUS, H. L. (1944), 'Gastro-Enterology'. Philadelphia: W. B. Saunders & Co.
6. CHATERJEE, S. C., DAS, D. C., and SENGUPTA, S. N. (1958), *J. Indian med. Ass.*, **30**, 35.
7. CHAUDHARI, R. N., and RAI CHAUDHARI, M. N. (1944), *Indian med. Gaz.*, **79**, 404.
8. CHANDLER, A. C. (1928), *Indian J. med. Res.*, **14**, 185.
9. CHANDLER, A. C. (1929), *Ibid.*, **15**, 143.
- 10a. DOGRA, J. R. (1941), *Ibid.*, **28**, 145.
- 10b. DOGRA, J. R. (1941), *Ibid.*, **28**, 481.
- 10c. DOGRA, J. R. (1941), *Ibid.*, **29**, 665.
11. GOPALAN, C., and RAMALINGASWAN, V. (1955), *Ibid.*, **43**, 751.
12. KEELE, K. D. (1946), *Brit. med. J.*, **iii**, 111.
13. KEELE, K. D., and BOUND, J. P. (1946), *Ibid.*, **i**, 77.
14. KONSTAM, P. G. (1954), *Lancet*, **ii**, 1039.
15. KONSTAM, P. G. (1959), *Indian J. med. Sci.*, **13**, 480.
16. LEISHMAN, A. W. D. (1945), *Lancet*, **ii**, 813.
17. MANSON-BAHR, P. (1941), *Trans. roy. Soc. trop. Med. Hyg.*, **34**, 347.
18. MENON, C. V. P., cited by Konstam, P. G. (1959).
19. NARSING RAO, M. (1938), *Indian med. Gaz.*, **73**, 454.
20. NISSEN, R. (1945), 'Duodenal and Jejunal Peptic Ulcer'. New York: Grune and Stratton.
21. OGILVIE, H. (1953), *Lancet*, **ii**, 555.
22. PATEL, J. C. (1954), *Indian J. med. Res.*, **42**, 279.
23. PAUSTIEN, F. F., and BOCKUS, H. L. (1959), *Amer. J. Med.*, **27**, 509.
24. SHRIVASAVA, J. B. (1953), *Indian J. med. Res.*, **41**, 397.
25. SOMMERVELL, T. H. (1942), *Brit. J. Surg.*, **30**, 113.
26. STEFANINI, M. (1949), *Acta med. scand.*, **133**, 113.
27. TRIBEDI, B. P., and GUPTA, D. M., cited by Ukil, A. C. (1942).
28. UKIL, A. C. (1942), *Indian med. Gaz.*, **77**, 613.

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