

HISTOPATHOLOGICAL STUDY OF TYPHOID PERFORATION OF THE SMALL INTESTINES

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INTRODUCTION

Typhoid fever is endemic in Indonesia and the disease may occur throughout the whole year. It is also one of the most common cause of fever in the tropical region. Poor hygiene and inadequate sanitation seems to be correlated with the disease. In the course of typhoid fever one of the most important and dangerous complication is perforation of the small intestines.

MATERIALS AND METHODS

A retrospective study was made of pathology specimens of typhoid perforation received by the Department of Pathology, Medical Faculty Padjadjaran State University/Dr. Hasan Sadikin General Hospital in Bandung, during the period of 1972-1976. This department gives its services not only to the Dr. Hasan Sadikin General Hospital but also to other hospitals in the city of Bandung and province of West Java.

This study is limited to materials from the hospitals in Bandung only. During the period of 5 years 184 cases of typhoid perforation were registered. New slides were made for histopathological study, if the old slides are in a poor state and not suitable for re-examination.

RESULTS

Table 1 shows that the number of cases of typhoid perforation is increasing constantly. In 1972 there were only 8 cases (4.3%) registered against 86 cases (46.7%) in 1976.

Table 1

Number and sex distribution of typhoid perforation cases.

Year	Male	Female	Total No. (%)
1972	6	2	8(4.3)
1973	12	3	15(8.2)
1974	15	7	22(11.9)
1975	44	9	53(28.8)
1976	65	21	86(46.7)
No. of cases	142	42	184
Per cent	77.2	22.8	

The sex distribution showed that typhoid perforation is more common among the males (77.2% males and 22.8% females).

The age distribution ranged from 3 years to 72 years, the majority being between the age of 15-19 years (18.5%) and decreasing in the older age groups (Table 2). Typhoid perforation seems to occur mostly among the young adults. Two cases of the series were 3 year old children.

In general the socio-economic status of the patients can be deduced from the hospital where they were admitted. Patients hospitalized in the Dr. Hasan Sadikin General Hospital and the Dustira Army Hospital usually belongs to the low income group. The middle income group are usually from the Immanuel Christian Hospital and the high income group from the Seventh Day Adventists Hospital and the St. Borromeus Catholic Hospital. Table 3 shows that 82.6% of the patients come from the low income

Table 2

Age distribution of typhoid perforation cases.

Age (Year)	1972	1973	1974	1975	1976	No.	%
0-4	-	-	-	1	1	2	1.0
5-9	2	4	1	3	6	16	9.0
10-14	1	-	4	5	9	19	10.3
15-19	3	3	5	9	14	34	18.5
20-24	-	3	4	6	15	28	15.2
25-29	-	3	2	14	9	28	15.2
30-34	1	-	3	4	5	13	7.1
35-39	1	-	1	4	8	14	7.6
40-44	-	1	1	1	11	14	7.6
45-49	-	-	-	2	3	5	2.7
50-54	-	-	-	-	2	2	1.0
55-59	-	-	-	-	1	1	0.5
60-64	-	1	-	3	-	4	2.2
65-69	-	-	-	1	2	3	1.6
70-74	-	-	1	-	-	1	0.5

group as compared to the middle and high income groups, 11.4% and 6.0% respectively.

Table 3

Economic status of patients with typhoid perforation.

Year	low income group		middle income		high income
	1)	2)	3)	4)	5)
1972	4	2	-	-	2
1973	12	1	1	-	1
1974	17	4	1	-	-
1975	39	4	6	1	3
1976	44	22	13	-	4
No. of cases	152		21		11
Per cent	82.6		11.4		6.0

1. Dr. Hasan Sadikin General Hospital.
2. Dustira, Army Hospital.
3. Adventists Hospital.
4. Immanuel Christian Hospital.
5. St. Borromeus Catholic Hospital.

The histopathological study was based on resected material of the perforated small intestine and regional mesenteric lymphnodes. Ulceration of the mucous membrane and necrosis was always present. The underlying submucosa was oedematous with engorgement of the capillaries. In some cases an early attempt to form granulation tissue was evident. Massive infiltration of the entire intestinal wall can be observed, consisting predominantly of lymphocytes, histiocytes and macrophages. Occasionally the infiltrate also consists of neutrophils and eosinophils. The macrophages situated close to the necrotic area usually showed the presence of ingested nuclear debris, erythrocytes and occasionally also typhoid bacilli within the cytoplasm. In a few cases macrophages were difficult to find, but massive infiltration with lymphocytes and histiocytes was always present. These are the so called "typhoid cells". The extent of ulceration varied from case to case. Sometimes the ulceration was very extensive leaving very little normal mucous membrane, but a wide area of necrotic tissue. In such a case the submucosal lymphoid tissue (Peyers patches) disappeared completely and was replaced by necrotic material. Only occasionally could one see an almost normal mucous membrane with some evidence of inflammatory reaction and a hyperplastic Peyers patch with foci of necrosis. Histologic examination of the mesentery nodes usually showed the presence of oedema, proliferation of the reticulum cells, focal areas of necrosis and infiltration with histiocytes and macrophages.

DISCUSSION

The clinical course of the disease usually showed more or less a classical pattern. In the early stage of the disease patients usually complains of malaise and headache, sometimes also of constipation. At the end of the first week fever developed, liver and spleen

became enlarged and the tongue is coated with a yellowish dirty material. Fever continues throughout the second and third week, and only at the end of the fourth week can it be expected to decrease. Perforation of the intestines usually developed at the end of the third week showing the clinical symptoms of shock and peritonitis.

Pathological changes starts at the end of the first week with a swelling of the Peyer patches, caused by oedema and hyperplasia of the elements of the lymphoid tissue, especially the reticulum cells. The overlying intestinal mucosa is stretched and flattened out, bulging somewhat into the lumen. If the patient continues to take solid food erosion of the vulnerable mucosa may develop. At the end of the second week foci of necrosis develops in the lymphoid tissue. Fusion of these necrotic foci may cause complete destruction of Peyer patches. Ulceration starts early during the third week if erosion of the intestinal mucosa reaches the already necrotic lymphnode. Inflammation and destruction of the entire muscular wall could lead to perforation and peritonitis.

Table 1 shows that the number of perforations increased constantly, which seemed to be directly correlated with the increase in the morbidity of typhoid fever itself. In 1974, 213 cases of typhoid fever were reported from the Hasan Sadikin General Hospital, with 22 perforations (10.3%). In 1975, 327 patients were hospitalized with typhoid fever, 53 of them developed perforation (16.2%). This is much higher than reported by Spencer in 1973 (2%).

Darmawan *et al.*, (1975) and Sunotoredjo *et al.*, (1977) from Indonesia reported only a slight difference in sex incidence. A similar condition was reported from Nigeria (Ikere *et al.*, 1975) and the Philippines (Sariono, 1975). Our series however showed a significant predominance of perforation among the males (77.2%).

Intestinal perforation and typhoid fever itself is more common among the young adults. Our series showed that almost 50% of the patients are between the age of 15 to 30 years and 19.3% between 5 and 14 years. This corresponds with reports of other research workers (Ikeme *et al.*, 1966; Darmawan *et al.*, 1975; Soriano, 1975; Sunotoredjo *et al.*, 1977). Two patients in our series were 3 years of age, probably the youngest ever reported.

The economic status of the patients can be associated with the hospitals where they are admitted. Most of the low income group goes to the Hasan Sadikin General Hospital and the Dustira Army Hospital for medical treatment. The middle income group usually goes to the Immanuel Christian Hospital, whereas most of the high income people visits the St. Borromeus Catholic Hospital and the Seventh Day Adventists Hospital. In our series 8.6% of the cases are from the Hasan Sadikin General Hospital and the Dustira Army Hospital, 11.4% from the Immanuel Hospital and only 6% are from the other two hospitals. It is premature to make any conclusions with regard to the difference in the number of cases among the three different economical groups of patients.

SUMMARY

A retrospective study was made on 184 cases of typhoid fever with perforation of the small intestines, during the period of 1972-1976. There is a constant increase noted in the morbidity and perforations of the small intestines complicating this disease. 50% of the cases were young adults between the age of 15 to 30 years and the 2 youngest cases were 3 year old children. Contrary to other reports, our studies revealed a significant predominance among male patients (77.2%). The pathological changes were typical and basically similar to that described by other investigators.

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