

The prevalence of liver abscess in Pohnpei State, Micronesia

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Introduction

Abscesses forming in the liver, principally from hematogenous spreads from the intestines, are relatively common in the developing countries, and Pohnpei State in the Federated States of Micronesia (FSM) is no exception. This review of a series of cases was prompted by experiences in the surgical and medical wards of the Pohnpei State Hospital, FSM in the years 1993 to September 1996.

Background

Pohnpei State of the Federated States of Micronesia (FSM) has about 38,000 people with an estimated average annual population growth rate of 3.3%.¹ In 1995, there was an average of seven persons per household. Of the total 6,030 households in Pohnpei State in a 1994 survey, only 50% of these have proper water-sealed toilets. Only the residents of Kolonia, and some of Sokehs and Nett have treated water supply. The other municipalities have their own water supplies, either from running streams, river, or collected rain water.²

Amoebiasis, in general, is endemic in Pohnpei. The most recent reports in FSM revealed an infection rate between 1.03-1.43%. These numbers reflected only the cases that actually sought medical attention. Thus many asymptomatic and symptomatic cases were unreported. However, FSM ranked third to Kiribati and the Marshall Islands which had 2% prevalence rate among the 10 Pacific countries with reported number of amoebic cases in 1988 and 1989.^{3,4}

Pohnpeians have their traditional drink sakau or kava. This drink is prepared from green Piper methysticum after removal from the ground. The soil on the roots of the kava plant are removed and cleaned with coconut husk before being pounded, and then squeezed through a green sheet of

hibiscus bark into a half coconut shell. The thick liquid can be heavily contaminated with soil and microbes. It is a social and ceremonial drink for adults.

Method

A retrospective review of patient charts with the diagnosis of liver abscesses from January 1993 to September 1996 (a period of 3 years and 9 months) was done at the Pohnpei State Hospital. The data was collected using the Pohnpei State Hospital computerised database, the Environment Protection Agency, and the Federated States of Micronesia (FSM) Health Statistics Office. Diagnosis in the patients chart were made on strong clinical suspicion and some confirmations by ultrasonography (USS).

Results

From January 1993 to September 1996, there were 27 cases reported.⁵ Table 1 shows the number of cases by age ranging from 3 to 70 years old, with a mean of 27 years. There was an obvious predominance of male to female (ratio 2.5:1). The overall rate per admission for the study period was 156 per 100,000 admission. Of the total cases, 14 (50%) were confirmed by USS.

Table 2 shows the total number of cases reported by municipality. The outer island of Pingilap had the highest rate of liver abscess and poorest water supply.

Half (14) of the cases were confirmed by USS of which ten (71.4%) had elevated alkaline phosphatase, and seven (53.8%) of those clinically suspected had increased alkaline phosphatase. Therefore seventeen (63.0%) of the total number of cases had elevated alkaline phosphatase. There were no confirmations by liver aspirates or blood culture. Two (2) cases were confirmed by exploratory laparotomy.

Treatments were basically by metronitazole 500 mg intravenously every eight hours till the fever subsided, then eight hourly oral metronitazole 500 mg for adults, and 250 mg. for children for an average of 2.2 weeks (ranges from 0.5 to 3 weeks). Twenty-three (85%) of the cases had intravenous antibiotics (combination of cephalexin/gentamycin, ampicillin/gentamycin, or chloramphenicol) with metronitazole over a period of 7 to 14 days. Only two cases had Iodoquinol 650 mg. orally eight hourly for three weeks after the course of metronitazole. Half of the cases that came back for follow-

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Table 1. Number of cases and rate of liver abscess per hospital admission. Number of cases confirmed with USS.

Variables	1993	1994	1995	1996	Total
Age. Range (years)	4-47	6-68	3-70	4-63	3-70
Age. Mean (years)	32	33	43	29	27
Male. No. of cases	2(1*)	5(3)	5(2)	7(4)	19(10)
Female. No. of cases	3(2)	1(1)	2(1)	2(0)	8(4)
Total No. of admissions	4,875	3,884	4,669	3,883	17,341
Crude rate of liver abscess per 100,000 admissions	105	206	149	232	156

** () encloses number of cases confirmed by Ultrasonography*

up in one to three weeks after discharge from the hospital had either improved significantly or completely asymptomatic. Half of the cases did not come back for follow-ups and there was no apparent recurrences as per patients' records.

Discussion

The incidence of liver abscess in the developed countries has not changed over the last 50 years, being estimated at 8-16 cases per 100,000 admissions.^{6,7,8} This study shows a annual rate of 20 per 100,000 of the total population for Pohnpei State compared to a rate of 105 - 232 per 100,000 of the hospital admission. Table 3 shows that in the developed world, liver abscesses are predominantly pyogenic, as compared to the developing countries. From the results of this study, Pohnpei has even a much higher crude rate of liver abscess, as compared to India.

Comparing Pohnpei State with the other FSM states, Table 5 shows a comparatively higher number of cases, as reported from the FSM Health Statistic Office. The figures may be exaggerated or under-reported in other States. The actual

number of cases as extracted from my search in Pohnpei State Hospital were 5, 6, and 7 for 1993, 1994 and 1995 respectively for Pohnpei State.¹¹ This mark discrepancy may be over reporting or misdiagnosis or under reporting on my part.

The high rate of liver abscess among the general population in Pohnpei, may be due to the water sources, personal hygiene, better diagnosis, and the way the sakau (kava) is prepared. A more comprehensive study is needed to look into these possibilities.

Clinical diagnosis of liver abscesses at the Pohnpei State Hospital, at times when ultrasound machine was non-functional or not available had proven real challenges. All cases presented with right upper quadrant pain and tenderness, and frequently with elevated alkaline phosphatase (63%), was difficult to differentiate clinically from acute cholecystitis - a condition increasingly common amongst Micronesians.

Most of the abscesses scanned were the solitary type and highly suspicious of amoebiasis. Clinical suspicion of a liver

Table 2. Cases and crude rate of liver abscess among the general population, by Municipality

Municipality	Number of cases (1993 - 1996)	Expected 1996 population	Crude rate per 100,000 per year
Kitti	8	5520	39
Madol	4	5278	20
Sokehs	5	6154	21
Kolonia	5	7100	18
Nett	3	6371	4
Pingilap	2	552	96
Total	27	35,915	20

Note: Above number of cases in 3.75 years. (3 years and 9 months).

Table 3. Crude incidence rate of liver abscess among the hospital admission, by country

Country	Annual incidence rate per 100,000 hospital admissions	Types of liver abscess
USA	8 - 16	Pyogenic > Ameobic
India	30 - 90	Ameobic > Pyogenic
Pohnpei	150 - 232	Ameobic > Pyogenic

abscess (either pyogenic or amoebic) is indicated when a patient has fever, right upper quadrant pain and tenderness, and abnormal liver function test, especially an elevated alkaline phosphatase. Ultrasound scanning is the choice to assess suspected liver abscess.⁶ It is non-invasive, and 80-90% accurate to pick abscess 2 centimeters. Computerized tomography (CT) scan is 90-95% accurate, but obviously too expensive for Pohnpei.

Treatment for liver abscesses at the Pohnpei State Hospital has been antibiotics for 7-14 days for those suspected of having secondary bacterial infection, in addition to metronitazole for at least two weeks. Iodoquinol, when available, should be included in the treatment regime. The traditional way of treating pyogenic liver abscesses has been open surgical draining and correction of predisposing surgical causes, but percutaneous drainage using pigtail catheter under ultrasound or CT scan has also been employed to drain pyogenic liver abscesses.⁹

Mortality rates of patients with macroscopic liver abscesses reported in the 1960-70's were 65-80%, but recently the mortality rate has been as low as 11%.^{7,8,9} Treatment of amoebic hepatic abscess is usually successful, mortality being associated with delayed diagnosis and complications i.e. bacterial superinfection or ruptured into adjoining structures. Improvements in mortality is due to widespread availability of ultrasound machines and CT scans because of earlier diagnosis and treatment.

This short retrospective collection of liver abscesses has shown Pohnpei State to be worse off than other developing countries. Most cases were likely to be amoebic. These certainly needs to have more indepth studies in the future.

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Table 4. Number of liver abscess cases and the crude rate in the general population, by State

Years	No. of cases (rate per 100,000)			
	Chuuk	Kosrae	Pohnpei	Yap
1993	0 (0)	5 (62)	23 (64)	6 (50)
1994	10 (22)	2 (25)	42 (117)	8 (66)
1995	10 (22)	2 (25)	26 (72)	3 (25)

Source: FSM Health Statistics Office

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