

URINARY CALCULI IN LIMBANG DISTRICT

LAU LIAK KOI
ONG AH TUAN

INTRODUCTION

THE causes and mechanisms of urolithiasis are even nowadays not well understood. An increased concentration of crystalloids in urine as happens, for example, in dehydration is one of the factors frequently cited. Randall (1937) drew attention to the importance of urinary tract infections as an initiating factor, and proposed that some stones started off as a plaque-like precipitate on the mucosal surface of the renal papillae. Carr (1954) further pin-pointed the lymphatics as the primary site. Boyce *et al.*, (1955) postulated that a fall in the concentration of "calcium-binding substances" which normally keep the calcium salts in solution, will cause stones to precipitate out. Boyce and Sulkin (1955) proposed uroproteins enter into linkage with crystalloids and salts are then precipitated into this mucoprotein matrix, with calculi as the end result.

An increasing number of patients with urinary calculi are being detected at the Divisional Hospital in Limbang. This study is made in an effort to find the overall incidence, sex and racial distribution and the relative frequency of single or multiple stones.

Limbang District is one of two Districts in the Fifth Division of Sarawak. It covers an area of 1,536 square miles and is generally hilly though part of the coastal lowlands are ear-marked for growing padi in the Limbang Valley Project. The main economy is based on timber and agriculture.

Lau Liak Koi
M.B., B.S. (Mal)

Ong Ah Tuan
M.B., B.S. (Mal)

Divisional Hospital,
Limbang.

The District is a literal culture mix-pot of ethnic groups. The population is estimated at 25,630 with the following racial breakdown:-

Malays	10,840
Iban	6,120
Bisaya	3,810
Chinese	3,620
Murut	810
Kelabits	250
Punans	180
Total	25,630

In this District, Limbang Hospital serves as the first and only referral point and is thus ideal as a catchment area for patients.

METHOD

The study was made in Limbang Divisional Hospital. The records and X-rays of all cases diagnosed as renal or ureteric colic, or any form of urinary calculi, from 1975 to 1979 were reviewed. Where necessary and possible patients were recalled for follow-up. No attempts were made to analyse the stones biochemically. Only people with radiologically proven calculi were included in the study. A total of 74 such cases were analysed. The number of admission to the hospital from 1975 to 1979 totalled 10,108.

RESULTS AND DISCUSSION

The 74 patients in the study have the following racial distribution as shown in Table I.

TABLE I
INCIDENCE AND PERCENTAGE* OF CALCULI BY RACES

Race Year	Malays	Ibans	Chinese	Muruts	Bisayas	Others	Total
1975	2	3	0	2	0	1 (Kelabit)	8
1976	3	1	1	1	0	0	6
1977	6	2	6	1	1	0	16
1978	7	2	3	2	3	0	17
1979	8	6	6	2	4	1 (Indian)	27
Total	26(34.7%)	14(18.9%)	16(21.6%)	8(10.7%)	8(10.7%)	2(2.7%)	74

*in brackets.

Urinary calculi appears to be a health problem which afflicts all ethnic groups in Limbang, sparing only the Punas who were not represented by any cases. This may be explicable by the facts that they live deep in the interior, which are generally less accessible, and are still essentially nomadic. They rarely venture out to Limbang and as a consequence are rarely seen at the hospital. The Malays contribute the highest percentage of cases. However, upon analysis by the Chi-square test, there was no significant relationship between the incidence of calculi and ethnic group, as shown in Table II.

In the study, males are affected more commonly than females, with an approximate ratio of 3:1. Calculi accounts for 7.32 per thousand of hospital admissions, and has an overall incidence in Limbang District of 2.9 per thousand of population.

The ages at which patients were first diagnosed range from as early as 18 years of age to 67 years of age, with a mean of 42.5 years. The highest frequency occurred in the age group 31 to 35 years, and almost half of all the cases occurred between 31 to 45 years of age.

TABLE II
RELATIONSHIP OF ETHNIC GROUP TO CALCULI

Race	Calculi	No Calculi	Total
Malays	26	48	74
Non-Malays	2,597	7,437	10,034
Total	2,623	7,485	10,108

$$\chi^2 = 3.273 \quad df = 1 \quad 0.1 > p > 0.05$$

45 (62%) of the cases were of patients residing in the vicinity of the town, or where some form of treated water supply was available. This probably conforms to the racial distribution of the population over a given geographical area. Thus the Chinese and Malays are mostly urban dwellers in the District, and so all of the Chinese and 23 out of 26 Malay patients came from these same areas. It is of interest to note, however, that not a single case came from the Malay Kampong of Seberang Kedai, situated just across the river, and to all intents and purposes, a part of the town except for the recent introduction of piped water, just three months ago.

The pipe water in Limbang has often been noted to leave a high residue in strainers, or

when left to stand, but without further tests and comparison, any relationship between these high residue and the occurrence of calculi must remain purely conjectural.

SUMMARY

74 cases of radiologically proven urinary calculi between 1975 and 1979 were analysed by race, sex and age. The relative frequency of single and multiple stones was also studied. The disease was found in all the ethnic groups present in Limbang except for the Punans. Possible reasons for this observation of their apparent absence were given. The absence of patients from one of the Malay Kampongs in Limbang town was also noted.

ACKNOWLEDGEMENT

We wish to thank Dr. Tan Yaw Kwang, Director of medical and Health Services, Sarawak

for permission to carry out the study and to publish this paper, Dr. Lim Nai Yien for his encouragement, Mrs. Jennie Mina Lee for helping to type the manuscript, Nursing Sisters for tracing notes and patients, Mr. & Mrs. Nihang Asai and the many others who have helped in their own individual ways.

REFERENCES:

- Boyce, W.H., Garvey, F.K. and Norfleet, C.M.(1955) The metal chelate compounds of urine: their relation to the initiation and growth of calculi, *Am.J.Med.*, **19**, 87-95.
- Boyce, W.H. and Sulkin, N.M. (1956) Biocolloids of urine in health and calculus disease. III. The mucoprotein matrix of urinary calculi, *J.Clin.Invest.*, **35**, 1067-1079.
- Carr, R.J.(1954) A new theory on the formation of renal calculi, *Br.J.Urology*, **26**,105-117.
- Randall, A. (1937) The initiating lesions of renal calculus, *Surg. Gynec. & Obst.*, **64**, 201-212.