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## A STUDY OF PREVALENCE RATE AND PREDISPOSING FACTORS OF GALL STONES IN SARABURI HOSPITAL PERSONNEL

Panida MUKDEEPROM<sup>1</sup>

### ABSTRACT

This paper reports the prevalence rate and possible risk factors of gall stone in Saraburi hospital personnel. 400 Cases were randomly selected for ultrasonographic examination of the abdomen. There were 64 men (16%) and 336 women (84%). Gall stones were found in 18 cases (4.5%). The prevalence is 1.6% in men (1 in 64 cases) and 5.1% in women (17 in 336 cases). The predisposing factors for gall stones are aging and increasing number of parity. Although there is more tendency for women and obese person to have gall stones according to this study but there is no statistical significant increased prevalence of gall stones in these two groups.

### INTRODUCTION

Gall stone is one of common diseases of western countries. Autopsy series in USA report at least a prevalence rate about 20% in women and 8% in men over 40 years of age. In eastern countries, gall stones are less common but there is a tendency to increase in prevalence of this disease due to dietary change. There are three types of gall stone: cholesterol stone, pigmented stone and mixed. The causes of cholesterol stones, which are mainly composed of cholesterol, are bile supersaturation, nucleation of cholesterol monohydrate and abnormality of gall bladder contraction or gall bladder stasis. Pigmented stones are mainly composed of calcium bilirubinate. This type of stone is common in Asian countries. They are caused by unconjugated insoluble bilirubin in bile which precipitated and became pigmented stones or nidus for cholesterol stones. There are many risk factors associated with formation of the gall stones such as aging, obesity, female sex, race, hereditary, parity, rapid weight loss, medication, ileal disease or resection, cystic fibrosis, cirrhosis, hemolysis and intravenous hyperalimentation. The pathophysiology of which is variably understood. For example, obesity increases cholesterol saturation of bile and the risk of stones formation. On the contrary, the pathophysi-

ological change that occur during aging that leads to increased risk of gall stone formation is not well understood. Most of the identified risk factors commonly said are fat, forty (aging), female and fertile (4F)

The clinical symptoms of gall stones are vary, there may be no any symptom at all for 'silent gall stone' or biliary pain which is fairly typical in most patients. Although this pain has many variations, the overall theme is similar for each patient. The pain is often in right upper quadrant or epigastrium. It may be referred to right shoulder. The hall mark of true biliary pain is episodicity. The pain may be accompanied by nausea and vomiting or diaphoresis and tachycardia, depend on the severity of the attack. Patients with milder symptom may describe as a pressure or heavy feeling, or a localized bloating. Cholecystectomy is the treatment of choice for symptomatic gall stone which includes both traditional open and laparoscopic approaches. Oral bile salt therapy, extracorporeal shock wave lithotripsy (ESWL) and percutaneous radiological extraction of the stones from the gall bladder are another alternatives but are less popular or still under investigation. The purpose of this study is to determine prevalence rate and risk factors of gall stones in Saraburi hospital personnel.

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<sup>1</sup> Department of radiology, Saraburi hospital, Saraburi

## MATERIAL AND METHOD

The population was obtained by calculating the formula:  $n = 400N/399+N$ , with 5% deviation. The calculated samples were 400 cases. Ultrasonography of the abdomen was used as the screening method due to high sensitivity rate for detection of the stone and low false positive rate. The examination included general examination of the abdomen with more con-

centrate on the gall bladder in supine and left lateral decubitus position. For female, ultrasonography of the lower abdomen were included. The collected data included age, sex, weight, height, number of parity, previous illness and associated diseases, dietary and weight status. The ultrasonographic data included presentation of gall stones or history of cholecystectomy due to gall stones and general pathology in the abdomen. All the collected data were analyzed for prevalence rate and risk factors by Chi-square test.

## RESULT

**TABLE 1** Prevalence rate of gall stone by sex.

Sex	Number		Gall stone found	
	%	N	%	N
Male	16.0	(64)	1.6	(1)
Female	84.0	(336)	5.1	(17)
Total	100.0	(400)	4.5	(18)

$$X = 1.64 \quad p = .6486$$

This table shows that total prevalence rate of gall stones in this group is 4.5%. There is no significant difference between prevalence rate in male or female but there is high tendency of gall stone in female sex than male.

**TABLE 2** Prevalence of gall stones by age.

Age(year)	Normal		Gall stone	
	%	N	%	N
20-29	98.2	(55)	1.8	(1)
30-39	98.0	(194)	2.0	(4)
40-49	93.5	(100)	6.5	(7)
50 Up	84.6	(33)	15.4	(6)

$$X = 22.58 \quad p = .0072$$

This table shows significant increased prevalence rate in aging. The prevalence rate is 6.5% in the group between age 40-49 years while the rate in the group of age 50 years up is 15.4%.



**TABLE 3 Prevalence rate of gall stones by weight status**

Weight status	Normal		Gall stone	
	%	N	%	N
Normal	94.6	(297)	5.4	(17)
Increased	98.6	( 68)	1.4	(1)
Decreased	100.0	(52)	-	(0)

$X = 4.87$        $p = .5606$

This table shows that weight status is not a significant risk factor for gall stone prevalence rate.

**TABLE 4 Prevalence rate of gall stones and associated diseases.**

Associated Disease	Normal		Gall stone	
	%	N	%	N
Non	96.2	(355)	3.8	(14)
DM	100.0	( 5)	-	(0)
Hyperlipidemia	85.0	(17)	15.0	(3)
Hemolytic anemia	83.3	(15)	16.7	(1)

$X = 12.05$        $p = .2104$

This table shows no significant correlation between associated diseases and prevalence rate of gall stones, however, high prevalence rate is noticed in hyperlipidemia and hemolytic anemia, 15% and 16.7% respectively.

**TABLE 5 Prevalence rate of gall stone by number of parity.**

No of parity	Normal		Gall stone	
	%	N	%	N
0	98.0	(101)	(2.0)	2
1	95.0	( 57)	(5.0)	3
2	94.2	( 97)	(5.8)	6
3	95.3	(41)	(4.7)	2
4	85.0	(17)	(15)	3
5	83.3	(5)	(16.7)	1

X = 31.89      p = .0226

This table shows significant increase of prevalence rate in multiparities, the prevalence rate is 15% and 16.7% in the group of 4 and 5 parities respectively.

**TABLE 6 Prevalence rate of gall stone by obesity.**

	Normal		Gall stone	
	%	N	%	N
Normal weight	97.0	259	3.0	8
Obesity	92.5	123	7.5	10

X = 5.80      p = .1218

This table shows that there is no significant correlation between gall stone prevalence rate and obesity.

**TABLE 7 Other diseases that incidentally found by ultrasonographic examination.**

Disease	
Cholesterol polyps of gall bladder	5
Absent of R.kidney	1
Chronic pyelonephritis	3
Renal stone	2
Ovarian cyst	5
Myoma uteri	4
Endometriosis	3

## DISCUSSION

Gall stone is one of common diseases. Studies of gall stone prevalence rates are difficult to perform and the results must be viewed in context of the population studied as well as the methods used to select and examine the population. The result for one population can not be applied to the others, particularly if the groups are differ in race, ethnicity or dietary habits. Many earlier prevalence reports used necropsy data which is useful for comparing prevalence rates between countries or ethnic groups but may not reflect the true prevalence<sup>8</sup> Ultrasonography is a sensitive screening method for detection of gall stone. Many studies report 9.4-11 % prevalence rate of total population, the rate was 6.7 - 9.4 % in male and 9.4 - 23.2 % in female. The rate is increased with aging. The highest prevalence rate is in Pima Indian, a report from USA which is as high as 48.6%.<sup>3,8</sup> There are few reports of prevalence rate from Asian countries. The prevalence of gall stone in hill tribes people in Northern part of Thailand, studied by the investigators from Nippon Medical School and Faculty of Medicine, Chiangmai University, is only 2.6%.<sup>4</sup> The rate is very low compared to the

Western studies. The prevalence rate in Saraburi hospital personnel is 4.5%, twice the rate of hill tribe people in the Northern part of Thailand. However this rate is still lower than the Western countries. A report from Denmark<sup>9</sup> described prevalence rate for males age 30,40,50,60 year to be 1.8%, 1.5%, 6.7% and 12.9% respectively, and for females age 30,40,50,60 years to be 4.8%, 6.1%, 14.4% and 22.4% respectively. This report is rather closed to the rate in Saraburi hospital personnel.

The risk factors that increase the prevalence rate of gall stone in this study are aging and multiparities which are the same as many reports.<sup>3,5</sup> Schuster<sup>5</sup> mentioned that age is the most predictive factor of gall stone. In this study although gall stone is found more in female and obese groups, it is not significant statistically. Also associated diseases such as DM, hypelipidemia and hemolytic anemia are not the risk factor for gall stone. However stone prevalence is rather high in hyperlipidemia and hemolytic anemia groups. Thus 4F hypothesis should be reduced to 2F which are Forty and Fertile by this study.

Other diseases that were incidentally found by Ultrasound study include 5 gall bladder polyps, 3 chronic pyelonephritis, 2 renal stones, 1 agenesis of



R.kidney. Gynecological problems are also common, 5 ovarian cyst, 4 myoma uteri and 3 endometriosis. This reflect that the hospital personnel are neglected for yearly physical examination.

### CONCLUSION

The prevalence rate of gall stone in Saraburi hospital personnel is 4.5% (18 in 400 cases) The rate in male is 1.6 % and the rate in female is 5.1%. Risk factor of gall stone is aging and multiparities. Female sex and obesity are not significant risk factor by this study.

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