Frequency of Abnormalities Detected by Upper Abdominal Ultrasound

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Objective: *The present study was undertaken to categorize frequency of abnormalities detected by upper abdominal ultrasound.*
Material and Method: *The present study was conducted on 3,398 people between the ages of 16 and 93 years old, who had the annual health check-up between October 2003 and May 2004 at the Health Promotion Center, Bangkok Hospital Medical Center (all of those participating were defined as "patients"). Of these, 1,930 are men (56.8%) and 1,468 are women (43.2%). In the present study, the data of age, gender, and upper abdominal ultrasound findings were assessed.*
Results: *Of the 3,398 subjects, 1,782 patients (52.4%) had positive findings; 1,147 of which were men (64.4%) and 635 were women (35.6%). Fatty liver, being the most common positive finding, was observed in 1,219 patients (35.9%); 831 of which were men (68.2%) and 388 were women (31.8%). The finding of a liver mass, as the second positive finding, was observed in 209 patients (6.2%); of which were 124 patients (59.3%) with hepatic cyst, 51 patients (24.4%) with hemangioma, 16 patients (7.7%) with indetermined nodule, 11 patients (5.3%) with calcification, and 7 patients (3.4%) with malignant tumor while 664 patients (19.5%) had other positive findings. The top four included gallbladder polyp observed in 181 patients (5.3%), renal cyst observed in 155 patients (4.6%), gallstone observed in 141 patients (4.2%), and renal stone observed in 101 patients (3.0%).*
Conclusion: *The prevalence of abnormalities detected by upper abdominal ultrasound was 52.44%. The most common finding was fatty liver (35.87%). Although the majority of positive findings were benign conditions, some of them might have an adverse effect to the health condition of patients in the long run. The ultrasound findings also yielded the patient management to prevent subsequent disease and to perform medical treatment or follow up.*

Keywords: *Upper abdominal ultrasound, Frequency of abnormalities*

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Today the diseases or abnormalities diagnosis using the ultrasound technique is frequently performed, especially to find the diseases or abnormalities in the liver and biliary system. Ultrasound, which is a medical device commonly used in many hospitals, is easy to handle, convenient and quick to diagnose the diseases in patients without pain and at a reasonable cost[1,13].

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However, there is insufficient study of prevalence of abnormalities detected by upper abdominal ultrasound among Thai people.

Hence, the authors conducted the present study to categorize frequency of abnormalities detected by upper abdominal ultrasound.

Material and Method

Subjects were 3,398 cases who had an annual health check-up at the Health Promotion Center, Bangkok Hospital between October 2003 and May 2004 (All defined as "patients"). The data of age, gender, and upper abdominal ultrasound findings were assessed.

All ultrasound studies were performed by the same experienced radiologist who was unaware of medical records of the patients, using a Phillips HDI 5000 with 3.5 MHz probe ultrasound machine. With p-value < 0.05 was considered significant.

The patients with radiological proof of upper abdominal abnormalities, based on ultrasound, Computed Tomography or Magnetic Resonance Imaging findings prior to the present study were excluded from the study group.

The ultrasound results were statistically analyzed by:

1. Descriptive Statistics - to describe the basic characteristics of subjects by means of percentage and bar graphs.

2. Inferential Statistics - to analyze the correlation between basic factors of subjects (age and gender) and positive findings using the Chi-square test.

Results

In 3,398 subjects, 1,930 were men (56.8%) and 1,468 were women (43.2%). The number of patients with positive ultrasound findings of abnormalities in the upper abdomen was 1,782, of which 1,147 were men (64.37%) and 635 women (35.6%). The number of patients with negative findings was 1,616, of which 783 were men (48.4%) and 833 women (51.6%), as shown in the following tables (Table 1-4).

Discussion

The prevalence of abnormalities detected by upper abdominal ultrasound was 52.4%[1]. Fatty liver had been found the most in 35.87% of patients, which is higher than those found in other studies[2-5]. Of interest was that the prevalence of fatty liver in men was significantly more than in women, which correlated well with the prior studies[3,4].

Table 1. The proportion of patients with positive findings to patients with negative findings

	Male n (%)	Female n (%)	Total n (%)
Total Patient	1,930 (56.8)	1,468 (43.2)	3,398 (100)
Positive Finding	1,147 (64.4)	635 (35.6)	1,782 (52.4)
Negative Finding	783 (48.4)	833 (51.6)	1,616 (47.6)

Table 2. Gender difference in prevalence of positive findings

Positive findings	Male (n = 1,147)	Female (n = 635)	p-value
Fatty liver; n (%)	831 (72.4%)	388 (61.1%)	<0.001
Liver mass; n (%)	99 (8.6%)	110 (17.3%)	<0.001
Others; n (%)	424 (37.0%)	240 (37.8%)	0.76

Table 3. Genders difference in prevalence of liver positive findings

Positive findings	Male n (%)	Female n (%)	Total n (%)
Fatty live	831 (68.2)	388 (31.8)	1219 (85.4)
Hepatic cyst	65 (52.4)	59 (47.6)	124 (8.7)
Hemangioma	17 (33.3)	34 (66.7)	51 (3.6)
Indetermined nodule	11 (68.8)	5 (31.2)	16 (1.1)
Calcification	8 (72.7)	3 (27.3)	11 (0.8)
Malignant tumor	3 (42.9)	4 (57.1)	7 (0.4)

Table 4. The prevalence of other positive finding (n = 3398)

Other positive findings	Number	Percent
Gallbladder polyp	181	5.3
Renal cyst	155	4.6
Gallstone	141	4.2
Renal stone	101	3.0
Splenomegaly	31	0.9
Renal mass	18	0.5
Parenchymatous renal disease	17	0.5
Hepatomegaly	5	0.2
Splenic mass	5	0.2
Adenomyomatosis Gallbladder	4	0.1
Pelvic kidney	2	0.06
Extrarenal pelvis	2	0.06
Double collecting system of kidney	1	0.03
Dilatation of ureter	1	0.03
Total	664	19.5

Although the fatty liver can be observed in patients without clinical symptoms, this abnormality coexists with obesity, hyperlipidemia, and diabetes mellitus. Other associated diseases are of nonalcoholic steatohepatitis (NASH) group, which were found in 2 to 3% of patients[2], but the significance is the subsequent effect on liver functioning[6,7].

The observed liver mass accounting for 6.15% of subjects includes hepatic cyst, hemangioma, indetermined nodule, calcification, and malignant tumor. Hepatic cyst was observed the most at 3.65%[1]. The next is hemangioma at 1.50%, which was found in women significantly more than in men and this result correlated well with other studies[8-10]. Seven patients had a malignant tumor which accounted for 0.21%. Of seven patients, three had hepatoma and four of them had metastatic tumor. Although the prevalence of these severe diseases is low, it is very critical to the patients.

Other positive findings accounted for 19.54% of subjects, consisting of gallbladder polyp (5.33%)[1,8], renal cyst (4.56%)[1,8], gallstone (4.15%)[1,8,11,12], renal stone (2.97%)[1], Splenomegaly (0.91%)[1], renal mass (0.53%), parenchymatous change of kidney (0.50%), hepatomegal (0.15%), splenic mass (0.15%), adenomyomatosis gallbladder (0.12%), pelvic kidney (0.06%) extrarenal pelvis (0.06%), double collecting system of kidney (0.03%), and dilatation of ureter (0.03%).

Most of these other findings were of the benign conditions, yet some were important to patients. For example, the gallbladder polyp with the size larger than 10 millimeters in diameter serves to increase the possibility of a positive report of cancer, thus the continuous follow up study is required. Renal stone and gallstone should be under observation because of the probability of subsequent adverse effect to patients. Oversized liver and spleen indicate other associated diseases or abnormalities. The observance of other normal variation with no clinical symptom is the vital physical information of patients that the physicians should be aware of as the indication for the future health condition of patients.

From the present study, the authors conclude that the upper abdominal ultrasound can detect many gross abnormalities. Although the majority of positive findings are benign conditions, some of them may have an adverse effect on the health condition of patients in the long run.

The present study focused only on prevalence of abnormality detected by upper abdominal ultrasound regardless of the cost-effectiveness.

Moreover, the present study was not conducted to study the correlation of diseases observed with other laboratory studies. Further studies are anticipated to have more value.

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วัตถุประสงค์*: เพื่อศึกษาอุบัติการณ์ของการตรวจพบความผิดปกติจากการตรวจอัลตราซาวด์ช่องท้องส่วนบน*
วัสดุและวิธีการ*: ทำการศึกษาวิจัยในผู้ป่วยจำนวนทั้งสิ้น 3,398 ราย แบ่งเป็นเพศชาย 1,930 ราย (56.8%) เพศหญิง 1,468 (43.2%) อายุตั้งแต่ 16-93 ปี โดยประชากรทั้งหมดเป็นผู้ที่มาตรวจสุขภาพประจำปี ที่ศูนย์ส่งเสริมสุขภาพ โรงพยาบาลกรุงเทพ ระหว่างเดือนตุลาคม พ.ศ. 2546 ถึง เดือนพฤษภาคม พ.ศ. 2547 โดยเก็บรวบรวมข้อมูลด้านอายุ, เพศ และผลการตรวจอัลตราซาวด์ช่องท้องส่วนบน (upper abdominal ultrasound)*
ผลการศึกษา*: จำนวนผู้ที่ตรวจพบความผิดปกติจากการตรวจอัลตราซาวด์ทั้งสิ้น 1,782 ราย (52.4%) แบ่งเป็นชาย 1,147 ราย (64.37%) หญิง 635 (35.63%) ความผิดปกติที่ตรวจพบมากเป็นอันดับหนึ่ง คือ ภาวะไขมันแทรกที่ตับ (fatty liver) จำนวน 1,219 ราย (35.87%) แบ่งเป็นชาย 831 ราย (68.17%) หญิง 388 ราย (31.83%) ตรวจพบก้อนในตับ (liver mass) จำนวน 209 ราย (6.15%) ซึ่งจำแนกออกเป็น hepatic cyst 124 ราย (59.33%), hemangioma 51 ราย (24.4%), indetermined nodule 16 ราย (7.66%), calcification 11 ราย (5.26%) และ malignant tumor 7 ราย (3.35%) ความผิดปกติอื่น ๆ ที่พบ 664 ราย (19.54%) ความผิดปกติอื่น ๆ 4 อันดับแรก ได้แก่ gallbladder polyp 181 ราย (5.33%), renal cyst 155 ราย (4.56%), gallstone 141 ราย (4.15%), renal stone 101 ราย (2.97%)*
สรุป*: จากการศึกษาในครั้งนี้พบว่าอุบัติการณ์ของการตรวจพบความผิดปกติ (positive findings) จากการตรวจอัลตราซาวด์ช่องท้องส่วนบน (upper abdominal ultrasound) คิดเป็น 52.44% ซึ่งความผิดปกติที่ตรวจพบมากที่สุด คือ ภาวะไขมันแทรกที่ตับ (fatty liver) 35.87% แม้ว่าความผิดปกติที่ตรวจพบส่วนใหญ่จะไม่ใช่โรคร้ายแรง (benign condition) แต่ความผิดปกติบางอย่าง อาจส่งผลต่อสุขภาพของผู้ป่วยในระยะยาวและมีผลต่อการปฏิบัติตัว เพื่อป้องกันโรคควรมถึงวิธีการดูแลรักษาของแพทย์ และการติดตามการรักษา*