

# Incidence of Pathologies Detected by Abdominal Ultrasonography Screening

## Karın Ultrasonografi Taraması ile Tespit Edilebilen Hastalıkların Sıklıkları

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### Özet

Konya il sınırları içinde ultrasonografi ile tespit edilebilen karın hastalıklarının sıklığını belirlemek. Çalışmaya katılacak kişi sayısını ve hedef kitleyi çalışmada yer alan istatistik uzmanı belirledi. Katılımcıların kimlik bilgileri, özgeçmiş ve soygeçmişini içeren kısa bir form dolduruldu. Karın ultrasonografisi hastalar sırt üstü yatar pozisyonda yapıldı. Ultrasonografi ile hepatobiliyer sistem, genitoüriner sistem, dalak, orta hat ana vasküler yapılar karın ön duvarı değerlendirildi. Ultrasonografi ile tarama yapılan 2010 kişinin yaş ortalaması 46 (18-94), 1071 (%53,3)' ü kadın, 939 (%46,7)' si erkekti. Yapılan karın USG' sinde, 371 (%18,5) kişide hepatosteatoz, 14 (%0,7) kişide karaciğerde hemanjiom, 11 (%0,5) kişide karaciğerde kisthidatik, 60 (%3,0) kişide safra taşı, 13 (%0,6) kişide splenomegali, 3 (%0,1) kişide dalakta basit kist, 4 (%0,2) kişide aort anevrizmasına rastlandı. Üriner sistemin incelenmesinde, 34 (%1,7) kişide taş, 145 (%7,2) kişide basit kist tespit edildi. Genital organların incelenmesinde 8 (%0,7) kadında myoma uteri, 4 (%0,4) erkekte prostat hipertrofisi tespit edildi. Konya toplumunda karın ultrasonografisinde sık rastlanan patolojik bulgular sırasıyla hepatosteatoz, böbrek kisti, safra kesesi taşı, böbrek taşı idi.

**Anahtar kelimeler:** Epidemiyoloji, ultrason, sağlık politikası

### Abstract

The aim of the study is determine the incidence of pathologies detected by abdominal ultrasonography in Konya. Screening has begun in 2011 after the necessary permissions from local ethical committee. Participants' identity, age, gender, history and family history has been recorded. Abdominal ultrasonography has been performed in supine position. Hepatobiliary, genitourinary systems, spleen, midline structures and anterior abdominal wall has been evaluated. The mean age of 2010 participants was 46 (18-94). There were 1071 (53.3%) female and 939 (46.7%) male. In abdominal ultrasonography; hepatosteatoz in 371 (18.5%), liver hemangioma in 14 (0.7%), hidatic cyst of liver in 11 (0.5%), cholelithiasis in 60 (3%), splenomegaly in 13 (0.6%), simple cyst of spleen in 3 (0.1%), aortic aneurism in 4 (0.2%) participants were detected. In renal evaluation; nephrolithiasis in 34 (1.7%) and simple cyst in 145 (7.2%) participants were detected. In pelvic evaluation; prostatic hypertrophy in 4 (0.4%) males and myoma uteri in 8 (0.7%) females were detected. In Konya population most common pathologies at abdominal ultrasonography were hepatosteatoz, renal cyst, cholelithiasis and nephrolithiasis.

**Key words:** Epidemiology, ultrasound, health policy

### INTRODUCTION

Examining the frequency and the factors affecting the frequency of diseases are defined as epidemiologic studies. These studies aim to introduce the frequency and reasons of the disease, determine the problems and improve community health. It is aimed to do this epidemiologic screening study in order to determine the frequency of the intra-abdominal diseases in the state of Konya to provide basis for the national eradication program and to detect true prevalence rate (1).

### MATERIAL and METHODS

Screening was carried out by the facilities of Konya Training and Research Hospital, Konya Provincial Directorate of Health and Metropolitan Municipality of Konya after taking the permit and legal consent of the ethical committee. With population weighted systematic clump sampling which will represent Konya's provincial population, 49 locations were selected from Konya city centre, districts and villages. Evaluation of 4900 people was targeted from these locations. Total

number of people for screening, clump volume and locations were determined by Selçuk University Department of Medical Statistics. The screening was performed in the determined locations by taking written consents of people who were older than 18 years old and who had accepted the screening. A short form which included the personal identifying information, age, sex, background and family history of people was filled in by the general surgery assistant in computer environment. Abdominal US examination was applied to the patients in the supine position with Shimadzu-Sarano device and convex prob with a 2-5 MHz wide frequency by radiology expert. Hepatobiliary system, genitourinary system, spleen and main vascular structures were evaluated.

### RESULTS

The average age of the 2010 people who were involved in the ongoing screening was 45(18-94) 936 (46,8%) of who are men and 1064 (53,2%) of who were women (Table 1). 898 (44,6%) of them was obese (BMI>30). Among these people, 1719 (85,5%) of them were living

in provinces and districts, 194 (9.7%) of them were living in villages and 97(4.8%)of them were living as nomads. 1029 (50.7%) housewives, 339 (16.9%) retired and 420 (20.9%) people were farmers and workers. 564 (28.1%) people were smokers, 22 (% 1) people were drinking alcohol. In the investigation 1929 (96%) people have no complaint. 1218 (60,6%) people had no surgery before in spite of that 792 (39,4%) people had several surgeries. Among them, 144 (7,16%) appendectomy, 121 (6,01%) cholecystectomy, 121 (6,01%) c-section surgery, 109 (5,42%) hernia operation, 51 (2,83%) prostat surgery and 27 (1,34%) cardiac surgery were detected. In abdominal ultrasonography; 1432 (71,2%) people have no pathological findings, when hepatobiliary system evaluate, hepatosteatois in 371 (18.5%), liver hemangioma in 14 (0.7%), hidatic cyst of liver in 11 (0.5%), cholelithiasis in 60 (3%)participants detected. In the spleen evaluation, splenomegaly in 13 (0.6%), simple cyst of spleen in 3 (0.1%) participants detected. When the intraabdominal main vascular tissues evaluate, aortic aneurism in 4 (0.2%) (1 female,3 male) participants were detected. In renal evaluation; nephrolithiasis in 34 (1.7%)( 22 of them in the left kidney) and simple cortical cyst like lesions in 145 (7.2%) participants were detected. In pelvic evaluation; prostatic hypertrophy in 4 (0.4%) males and myoma uteri in 8 (0.7%) females were detected.

## DISCUSSION

It is an operation which can be made easily to evaluate intra-abdominal organs by ultrasonography with little cost and does not give harmful rays to the patient. Evaluation of the liver, spleen, pancreas and prostate, gall bladder and main vascular structures from hollow organs in terms of expansion, presence of stone, cyst, mass and density change can be made in high sensitivity (1). The sensitivty of the use of USG for scanning purposes in asymptomatic population was relatively high and its specificity was found sufficient. USG was also used for scanning purposes in evaluating the structure of the liver, the determination of gallstones and kidney stones and the determination of aortic aneurysm (2-5). In our study, we made scanning with USG in locations which we consider the representative of Konya community in terms of the presence of intraabdomen diseases and pathologic changes. Simple liver fattening is usually a clinically benign and reversible condition but

the steatosis which develops in some of the patients can progress and result in cirrhosis and hepatocellular carcinoma (6). The actual frequency of liver fattening is not known and it is the most common liver disease in industrialized countries (7). We tried to determine the frequency of liver fattening by ultrasonography in our industrializing country. The sonographic diagnosis of the fatty liver was made by the echogenicity increase and the presence of increased echo of the liver in comparison with the kidney. Ultrasonography is a monitoring method which allows the determination of the liver fattening by 83% sensitivity and 100% specificity (8). Liver fattening (Hepatosteatois) in the general population is about 20% in the last studies (9). It is 19.8% in the studies done in our country and it is 18,5% in our study. There is some data indicating that obesity constitutes more risk than alcohol for the fatty liver (8). 57,9% of those who were diagnosed the fatty liver in our study was obese. While it is more frequently seen in men younger than 40, the difference between men and women is made up because women go towards menopause after 40. Gall bladder stone is the most frequent biliary disease. Gallstone incidence in the autopsy series is 11-36%. While gallstone is seen at 36% in those with dyspeptic complaint, it is 8% in those with no complaints (10,11). USG is a monitoring method with high sensitivity rate (98%) which is most frequently used in the determination of gallstones (5). While 8% gallstone was seen in the western community (England), 10% gallstone was determined in the eastern community (India) in determining gallstone in asymptomatic persons by USG (5).

While the frequency of gallstone in asymptomatic persons was found as 7,79 % in 1992, it was found as 13% in our country on asymptomatic persons in 2012 (11). In literature, in the studies done, Pant and Gupta determined gallstones in 62 (2.48%) persons in the abdomen USG of 2500 persons, Brinholz determined gallstones in 64 (11%) persons in the abdomen USG of 581 asymptomatic persons (5). From 2010 participants gall bladder stone was found in 60 people (3%) in our study. If we consider those with cholecystectomy were operated due to gallstone, it is possible to define gallstone prevalence (121 cholecystectomy and 60 nonoperated gallstone) as 181 (9%) in our study. Being a woman, elder age and obesity are effective in the formation of gallstone (5-12). 58.3% of them was seen in women, 51.6% in obese people and 73.3% in people older than 40. Urinary system stone disease is a disease disturbing people in any period of their lives in 10% of the general population. It is seen three times more frequently in men rather than women. Its frequency is between 4-20% and it increases with the age (13-14). USG is an advantageous method in determining urinary stones because it does not contain radiation, it can be used repetitively and it does not require a contrast application (13). Despite having high sensitivity in the determination of kidney stones, USG does not have the same sensitivity in the determination of ureter stones (13,14). It is an epidemiological scanning through which urinary system stone disease determination has been made very rarely by using ultrasonography (3,14). Urinary system stone prevalence is 5.5% in Germany, 5.2% in the USA, 5.7% in Iran(15-18). While urinary system stone incidence was found 14, 8% in a study which was performed in our country(19), it was found 14,6% in a study which scanned 5700 applicants of a urology policlinic (14), and kidney stone incidence was found 4,02% in another study which scanned 1095 persons by abdomen USG (3). Kidney stone incidence was 1.7% in our study which was determined to be lower than the one described in literature. Urinary stone disease was reported to have been seen more frequently in adults, those living sedentary lives and men (20). In our study, kidney stone diseases were found 58.8% in those over 40 years old and 67.6% in men, 50% in retired people, 70.6% in urban people.

**Table 1.** Distribution of the participants according to the age groups.

| Age Groups | Sex | Sex   |        | Total |
|------------|-----|-------|--------|-------|
|            |     | Male  | Female |       |
| 18-30      | n   | 198   | 186    | 384   |
|            | %   | 21,3  | 17,4   | 19,2  |
| 31-40      | n   | 194   | 236    | 430   |
|            | %   | 20,7  | 22,0   | 21,4  |
| 41-50      | n   | 188   | 267    | 455   |
|            | %   | 20,0  | 24,9   | 22,6  |
| 51-60      | n   | 147   | 193    | 340   |
|            | %   | 15,6  | 18,0   | 16,9  |
| 61-70      | n   | 115   | 119    | 234   |
|            | %   | 12,2  | 11,1   | 11,6  |
| 71-        | n   | 97    | 70     | 167   |
|            | %   | 10,3  | 6,5    | 8,3   |
| Total      | n   | 939   | 1071   | 2010  |
|            | %   | 100,0 | 100,0  | 100,0 |

**Table 2.** Sociodemographic properties of the people detected hepatosteatosi, cholelithiasis and nephrolithiasis by the abdominal US

|                               | Hepatosteatosi   |       | Cholelithiasis |       | Nephrolithiasis |       |      |
|-------------------------------|------------------|-------|----------------|-------|-----------------|-------|------|
|                               | n                | %     | n              | %     | n               | %     |      |
| Total                         | 371              | 18,5  | 60             | 3,0   | 34              | 1,7   |      |
| Mean Age                      | 50               | 19-83 | 54             | 20-83 | 48              | 30-89 |      |
| Sex                           |                  |       |                |       |                 |       |      |
|                               | Female           | 194   | 52,3           | 35    | 58,3            | 11    | 32,4 |
|                               | Male             | 177   | 47,7           | 25    | 41,7            | 25    | 67,6 |
| Distribution according to age | 19-40            | 93    | 25,1           | 16    | 26,7            | 14    | 41,2 |
|                               | 41-60            | 198   | 53,4           | 23    | 38,3            | 10    | 29,4 |
|                               | 61-90            | 80    | 21,5           | 21    | 35,0            | 10    | 29,4 |
| Body Mass Index (BMI)         | 19-24            | 34    | 9,2            | 13    | 21,7            | 9     | 26,5 |
|                               | 25-29            | 122   | 32,9           | 16    | 26,7            | 14    | 41,2 |
|                               | 30-44            | 215   | 57,9           | 31    | 51,6            | 11    | 32,3 |
| Job                           | Housewife        | 190   | 51,3           | 34    | 56,7            | 8     | 23,5 |
|                               | Retired          | 70    | 18,8           | 18    | 30,0            | 17    | 50,0 |
|                               | Actively Working | 111   | 29,9           | 8     | 13,3            | 9     | 26,5 |
| Where they live               | Village          | 143   | 38,5           | 12    | 20,0            | 10    | 29,4 |
|                               | City Center      | 228   | 61,5           | 48    | 80,0            | 24    | 70,6 |
| Habits                        | Cigarette        | 103   | 27,8           | 22    | 36,7            | 13    | 38,2 |
|                               | Alcohol          | 4     | 1,1            | -     |                 | 1     | 2,9  |
|                               | None             | 264   | 71,1           | 38    | 63,3            | 20    | 58,9 |

The differences in the urinary system stone disease prevalence data in our country can be explained with the sampling used being rural or urban settled and taking mostly men over a certain age into the sampling or the studies' being done in selected groups.

Abdominal aortic aneurysm (AAA) rupture constitutes 0,9-1,9% of sudden deaths (21). 80% of the patients with spontaneous AAA rupture die before reaching the hospital. It is a vein disease which can be determined without rupture and whose AAAs can be surgically treated. AAA prevalence was determined as 5.1% in men over 65 years old, 1.3% in women(4). 80% of AAAs was asymptomatic. USG has 98% sensitivity and specificity in the determination of AAAs and it is a simply applied, cheap and mortality minimizing method. (4). AAA can be determined by USG scanning from 3 cm. 25% of the AAAs determined is beyond 4 cm and 10% is beyond 5 cm. AAA which is longer than 4 cm involves the risk of spontaneous rupture and rupture risk increases as dimension increases. AAAs which are longer than 5 cm have surgical treatment indication (22). AAA was determined in 2010 persons 4 (0,2%) in our study and it was found lower when compared to literature. Our patients with AAA were three men who were older than 65, and one woman who was 36 years old. The study has not been completed yet and the data has been presented as early results. We will be able to present clearer results upon the completion of the study.

Frequently encountered pathologic findings in the abdomen USG in Konya community were hepatosteatosi, kidney cyst, gallstone, and kidney stone respectively. Knowing the regional frequency of these diseases may be useful in determining necessary investments for protection and treatment in these regions.

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