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Liver Size and its Correlation with Anthropometric Parameters and Age

El Tamaño del Hígado y su Correlación con los Parámetros Antropométricos y la Edad

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SUMMARY: The liver has over 500 physiological and biochemical roles in our organism so checking of liver size and function is a part of every clinical examination. Aim of our research was to estimate liver size on computed tomography (CT) of the abdomen images and to determinate relations between liver dimensions and anthropometric parameters. The research included 99 patients, 49 men and 50 women, who were referred for CT of abdomen. We measured body height (BH) and body mass (BM), and calculated body mass index (BMI) and body surface area (BSA). Also, on CT images we measured anteroposterior (AP), laterolateral (LL) and two craniocaudal liver diameters (one at the level of midclavicular line - CCmcl, and the other was maximal - CCmax). Liver volume (LV) was calculated with formula. Our results showed that AP diameter positively correlated with BSA (r=0.30) in women. LL diameter positively correlated with BH (r=0.43), and BSA (0.31) in men. CCmcl diameter positively correlated with BH (r=0.33), BM (r=0.31), and BSA (r=0.34) in men, while in women it correlated only with BH (r=0.38). CCmax diameter positively correlated with BH (r=0.33) and BSA (r=0.33) in men. LV positively correlated with BH and BSA in both men (r=0.36, r=0.33, respectively) and women (r=0.42, r=0.31, respectively), and in men also with BM (r=0.34). LL, CCmcl, CCmax, and LV negatively correlated with aging in both sexes After the age of 60, there was a decrease in size of LL, CC diameters, as well as in LV. We concluded that liver dimensions decrease with aging, regardless of sex at the expanse of LL and CC diameters which are related to the size of body parameters, so that for a precise evaluation of liver size all three diameters should be measured, LV as well as BH, BM, and BSA.

KEY WORDS: Liver diameters; Body height; Body mass; Body surface area; Computed tomography.

INTRODUCTION

The liver, as the largest parenchymatous organ in the human body, participates in numerous essential biological functions such as the metabolism of micro- and macronutrients, regulation of blood volume, stimulation of the immune system function, endocrine control of regulatory processes, homeostasis of carbohydrates (deposition of glycogen and glyconeogenesis), lipids (beta-oxidation of fatty acids) and proteins, bile production, and excretion, bilirubin, cholesterol, and triglycerides excretion, break down of xenobiotic compounds, including many drugs (Guyton & Hall, 2004; Trefts *et al*., 2017). Due to its important function in the human body, it is necessary to evaluate liver function and morphology as precisely as possible, already during the basic physical examination in daily clinical practice (Thomson & Takebe, 2021).

Liver size is a reflection of its function. The presence of pathological focal and diffuse changes in the liver parenchyma (carcinomas, metastases, cirrhosis, acute hepatitis, biliary cholangitis, sarcoidosis) as well as certain diseases (right heart failure, disorders of glycogen accumulation, Gaucher's disease, Niemann-Pick disease, galactosemia, viral infections, inflammatory conditions) lead to its increase (Lestra *et al*., 2018). On the other hand, its decrease occurs due to the low-protein diet implemented in bariatric patients before the surgery (Wissen *et al*., 2016).

The first step in assessing the size of the liver is palpation and percussion of the abdomen, where a normal-sized liver is not available for examination. In contrast, in the case ofhepatomegaly, the liver is palpated under the right rib

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cage (Ivkovic-Lazar *et al*., 2013). For the more precise evaluation of the liver size and morphology, radiological methods are used. First of all, abdominal ultrasonography, then computed tomography (CT) of the abdomen, and, as the most sophisticated method, magnetic resonance (MR), which provides the best imaging of the liver structure (Childs *et al*., 2014; Lestra *et al*., 2018). Ultrasound allows only the determination of diameters, i.e., linear measures of the liver, while CT and MR can also provide information on the liver volume (LV).

When assessing liver size, radiologists adhere to reference values for anteroposterior (AP), craniocaudal (CC), and laterolateral diameter (LL), which are uniform throughout the world. Still, according to the literature, liver dimensions also depend on race, ethnicity, sex, and age. They are directly related to anthropometric parameters such as body height (BH), body mass (BM), and body mass index (BMI), and there are also described morphological variations of the liver (Ekpo *et al*., 2013; Sharma *et al*. 2016). Because of all of the above, it is important to have an individual approach to each patient and consider all these parameters before the doctor declares that there is a deviation from the normal size of this organ. Our research aimed to determine the average values of liver dimensions in our population and examine the relation of liver dimensions with aging, sex, and anthropometric characteristics.

MATERIAL AND METHOD

The research was conducted at the Radiology Center of the University Clinical Center of Vojvodina in Novi Sad, Serbia. The study involved 99 patients, 49 men and 50 women, who were referred for computed tomography (CT) of the abdomen as part of a diagnostic procedure during their hospitalization. All patients voluntarily agreed to participate in the study and they confirmed it with their signature. The research lasted from December 2022 to May 2023 and was approved by the Ethics Committee of the University Clinical Center of Vojvodina in Novi Sad (No. 00-236, at 16th December 2022).

The criteria for inclusion in the research were:

- persons of both sexes, aged 18 years and over;
- indication for computerized tomography examination of the abdomen by a specialist doctor;
- regular values of biochemical parameters of liver function (bilirubin, aspartate aminotransferase, alanine aminotransferase and gamma glutamyl transferase);
- normal radiological findings on the liver;
- voluntary consent to participate in research.

The criteria for exclusion from the research were:

- existence of any pathological changes in the liver, including fatty infiltration of the liver;
- the presence of anatomical variations of the liver (additional fissures in all lobes, groove and lobulations in the anterior surface, conical shaped right lobe, notched margin, elongated left lobe/Beaver's lobe, underdeveloped caudate process, hypertrophied caudate process, abnormally upturn papillary process, enlarged papillary process, underdeveloped papillary process, quadrate lobe with tongue like projection, a downward tongue-like projection of the anterior edge of the right lobe/Riedel's lobe, bilobed quadrate lobe, pons hepatis, accessory lobe) (Singh & Rabi, 2019):
- existence of any oncological, metabolic or infectious disease, as well as a diagnosis of heart failure;
- existence of an acute or chronic inflammatory process in the body;
- renal insufficiency (increased level of urea and creatinine);
- exposure to chemotherapy in the previous two years;
- allergy to the contrast medium for computed tomography;
- refusal to participate in research.

Data about biochemical parameters of liver function (bilirubin, aspartate aminotransferase, alanine aminotransferase and gamma glutamyl transferase) were obtained from the available medical records of the patients.

Body height (BH) was measured with a GPM anthropometer (Sieber&Hegner, Zürich, Switzerland), with a measurement accuracy of 0.1 cm. The measurement was performed in an upright position, when the line which connects the tragus of the auricle with the inner corner of the eye, at the same side (Frankfurt plane) was placed horizontally. A digital scale was used to measure body mass (BM), with a precision of 0.1 kg.

Body mass index (BMI) was used to assess the level of nutrition, which represents the quotient of body mass and the square of body height expressed in meters ($BMI=BMkg/BHm^2$) (World Health Organization, 2021).

Body surface area (BSA) was calculated using the Du Bois formula: $0,007184 \times BM^{0,425} \times BH^{0,725}$ (Du Bois & Du Bois, 1916).

Computed tomography of the abdomen was performed at the Radiology Center of the University Clinical Center of Vojvodina in Novi Sad. Imaging was carried out on General Electric Revolution 128, Siemens Somatom 64 and Toshiba Aquilion Prime SP160 CT scanners.

Liver dimensions were analyzed on contrast CT images (slice thickness of 0.625 mm, venous phase) in an image-management software that provides scalable local and wide area for hospitals and related institutions - CARESTREAM Vue PACS Power Viewer. We measured three diameters: AP - anteroposterior diameter (Fig. 1), LL - laterolateral diameter (Fig. 2) and CC - craniocaudal diameter, which was measured at two levels: at the level of the medioclavicular line (CCmcl), as well as the maximum CC diameter (CCmax) (Fig. 3). AP diameter was measured in the axial plane at the level of the medioclavicular line, LL diameter was also measured in the axial plane at the level of the largest dimensions, while CCmcl and CCmax diameters were measured in the frontal plane.

According to data from the literature, the reference value for the AP diameter measured in the axial plane at the level of the medioclavicular line is 16 cm, for the maximum LL diameter is 23 cm, and for the CC diameter is measured in the frontal plane at the level of the medioclavicular line (our CCmcl) is 13.5 cm (Kennedy & Madding, 1977).

We calculated the liver volume according to the formula: AP diameter x LL diameter x CC diameter x 0.31 (Verma *et al*., 2010; Ibrahim & Ayad, 2018).

For statistical processing and data analysis, we used the SPSS 24.0 software package (SPSS, Inc, Chicago, IL). Tests were performed with a significance level of $p<0.05$.

To assess the difference between groups, we used Student's t-test for parametric features and Kruskal Wallis test for nonparametric features.

To examine relationship of selected variables, we used Pearson's correlation analysis.

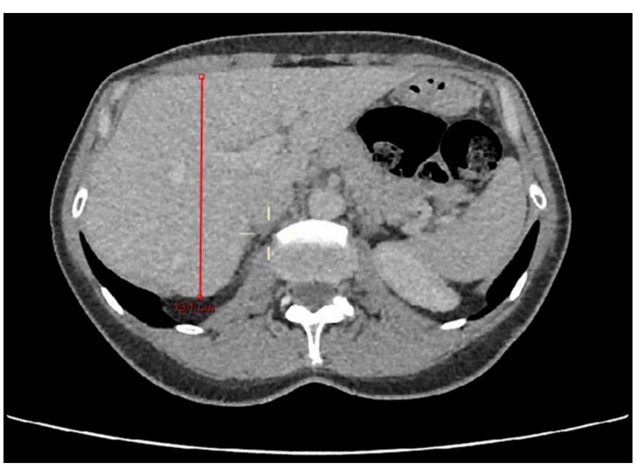

Fig. 1. AP diameter, measured in the axial plane at the level of the medioclavicular line (red line).

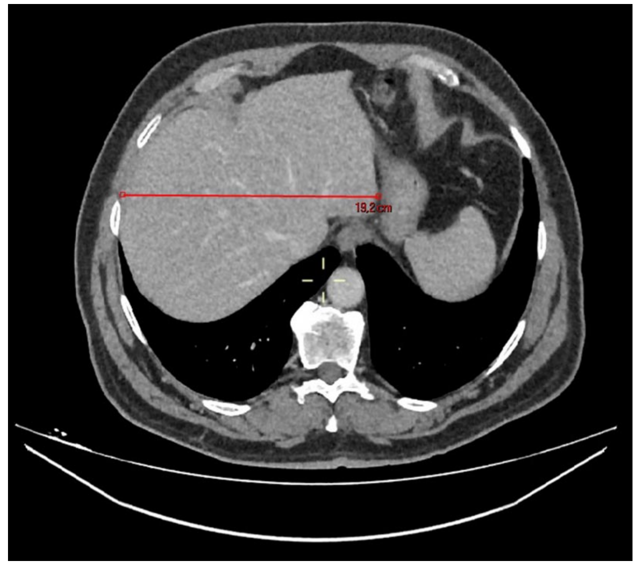

Fig. 2. LL diameter, measured in the axial plane at the level of the largest dimension (red line).

Fig. 3. CC diameter, measured in the frontal plane at the level of the medioclavicular line (CCmcl, red line), and at the level of the largest dimensions (Ccmax, green line)

RESULTS

In our research participated a total of 99 people, 49 men and 50 women. The average age was 61.72±14.44 years, body height 171.62±9.63 cm, body weight 76.32±14.73 kg, BMI 25.84±4.16 kg/m^2, BSA 1.88±0.21 m^2, AP diameter 14.83±1.28 cm, LL diameter 18.58±2.17 cm, CCmcl diameter 10.95±2.01 cm, CCmax diameter 15.59±2.28 cm and liver volume 1342.47±372.47 ml (Table I). All patients were same race (white) and ethnicity (serbian), so they did not differ on that way.

Table I. Sociodemographic and anthropometric characteristics of all respondents.

Parameters	N	X	SD
Age (years)	99	61.72	14.44
BH (cm)	99	171.62	9.63
BM (kg)	99	76.32	14.73
BMI (kg/m^2)	99	25.84	4.16
BSA (m^2)	99	1.88	0.21
AP (cm)	99	14.83	1.28
LL (cm)	99	18.58	2.17
CCmcl (cm)	99	10.95	2.01
CCmax (cm)	99	15.59	2.28
LV (ml)	99	1342.47	372.47

Men were statistically significantly taller than women (177.71±8.85 vs. 165.64±5.93 cm), had a higher BM (81.82±14.59 vs. 70.94±12.88 kg), higher BSA (1.99±0.20 vs. 1.78±0.16 m^2), larger AP liver diameter (14.54±2.25 vs. 13.13±2.11 cm) and larger LV (1435.73±374, 35 vs. 1251.07±350.66 ml), Table II.

Through further analysis we found that in men LL liver diameter was positively correlated with BH (r=0.43) and BSA (r=0.31), while it was negatively correlated with age (r =-0.37), CCmcl diameter was positively correlated with BH (r=0.33), BM (r=0.31), and BSA (r=0.34), and negatively with age (r=-0.37), CCmax diameter was positively correlated with BH (r=0.36) and BSA (r=0.33), while negatively correlated with age (r=-0.47), and liver volume positively correlated with BH (r=036), BM (r=0.34) and BSA (r=0.37), while it negatively correlated with age (r=-0.39), Table 3. On the other hand, AP diameter did not significantly correlate with any of parameter (Table III).

In women AP liver diameter significantly positively correlated with BSA (r=0.30), LL diameter negatively correlated with age (r=-0.41), CCmcl diameter positively correlated with BH (r=0.38), and negatively with age (r=-0.37), CCmax diameter negatively correlated with age (r=-0.47), and

Table II. Differences in age, anthropometric parameters and liver dimensions according to sex.

Variables	Men N=49 X±SD	Women N=50 X±SD	t	p
Age (years)	61.53±15.33	61.90±13.67	-0.13	0.90
BH (cm)	177.71±8.85	165.64±5.93	7.99	**0.00**
BM (kg)	81.82±14.59	70.94±12.88	3.93	**0.00**
BMI (kg/m^2)	25.83±3.83	25.85±4.51	-0.02	0.98
BSA (m^2)	1.99±0.20	1.78±0.16	5.75	**0.00**
AP (cm)	14.54±2.25	13.13±2.11	3.21	**0.00**
LL (cm)	18.94±1.62	18.22±2.56	1.68	0.10
CCmcl (cm)	11.07±2.07	10.83±1.95	0.59	0.56
CCmax (cm)	15.62±2.37	15.57±2.21	0.11	0.91
LV (ml)	1435.73±374.35	1251.07±350.66	2.53	**0.01**

Table III. Association of liver dimensions with age and anthropometric parameters in men.

	Age (years)		Body Height (cm)		Body Mass (kg)		BMI (kg/m^2)		BSA (m^2)	
Liver parameters	r	p	r	p	r	p	r	p	r	p
AP	0.03	0.82	0.01	0.92	0.21	0.14	0.25	0.08	0.17	0.24
LL	-0.37	**0.01**	0.43	**0.00**	0.24	0.10	0.01	0.97	0.31	**0.03**
CCmcl	-0.37	**0.01**	0.33	**0.02**	0.31	**0.03**	0.16	0.28	0.34	**0.02**
CCmax	-0.47	**0.00**	0.36	**0.01**	0.27	0.06	0.11	0.46	0.33	**0.02**
LV	-0.39	**0.01**	0.36	**0.01**	0.34	**0.02**	0.19	0.20	0.37	**0.01**

Table IV. Association of liver dimensions with age and anthropometric parameters in women.

	Age		Body Height		Body Mass (kg)		BMI		BSA	
Liver parameters	r	p	r	p	r	p	r	p	r	p
AP	0.04	0.77	0.24	0.09	0.27	0.06	0.18	0.20	0.30	**0.03**
LL	-0.41	**0.01**	0.26	0.07	0.20	0.17	0.10	0.50	0.24	0.10
CCmcl	-0.37	**0.01**	0.38	**0.01**	0.07	0.61	-0.08	0.57	0.17	0.24
CCmax	-0.47	**0.00**	0.28	0.05	-0.2	0.91	-0.13	0.37	0.06	0.67
LV	-0.43	**0.00**	0.42	**0.00**	0.23	0.10	0.07	0.64	0.31	**0.03**

liver volume positively correlated with BH (r=0.42) and BSA (r =0.31), while there was a negative correlation with age (r=-0.43) (Table IV).

By dividing all subjects into three age categories (<40 years, 40-60 years and >60 years), we determined that AP diameter first increased and then decreased with age, but it was not significant. CCmcl diameter decreased with age, and it also was not significant. On the other hand, it was significant decrease of LL diameter according to age. Also, there was first a significant increase and then a decrease of CCmax diameter as well as the LV, so middle-aged patients had the highest, and the oldest patients had the lowest values of these dimensions (Table V).

Table V. Association of liver dimensions with aging.

Liver Parameters	Age Groups	N	Mean Rank	X±SD	Chi-Square	df	p	Age Groups		p
AP (cm)	< 40	6	38.83	13.95±2.52	1.0	2	0.61	< 40	40-60	/
	40-60	33	51.41	14.97±2.30				40-60	> 60	/
	> 60	60	50.34	14.84±2.27				< 40	> 60	/
LL (cm)	< 40	6	79.25	20.58±0.91	16.71	2	**0.00**	< 40	40-60	0.45
	40-60	33	60.86	19.39±1.95				40-60	> 60	**0.01**
	> 60	60	41.10	17.93±2.11				< 40	> 60	**0.00**
CCmcl (cm)	< 40	6	69.00	12.25±1.73	8.37	2	**0.01**	< 40	40-60	1.00
	40-60	33	58.26	11.58±2.21				40-60	> 60	0.05
	> 60	60	43.56	10.47±1.78				< 40	> 60	0.12
CCmax (cm)	< 40	6	64.50	16.65±1.59	19.10	2	**0.00**	< 40	40-60	1.00
	40-60	33	65.85	16.87±1.92				40-60	> 60	**0.00**
	> 60	60	39.83	14.78±2.17				< 40	> 60	0.13
LV (ml)	< 40	6	61.50	1508.55±429.75	15.06	2	**0.00**	< 40	40-60	1.00
	40-60	33	64.30	1525.13±357.62				40-60	> 60	**0.00**
	> 60	60	40.98	1225.40±331.68				< 40	> 60	0.29

* Differences between groups were determined on the basis of mean ranks (Kruskal Wallis test). X±SD values were added only to show the values in age categories, and were not used to examine differences between groups.

DISCUSSION

In adults, the liver comprises 2 % of the total BM, and it is about 1.5 kg. During fetal development, hematopoiesis takes place in the liver, so in newborns liver is relatively large and has a more significant contribution to the total BM (Guyton & Hall, 2004; Patzak *et al*., 2021; Waelti *et al*., 2021). Nowadays, radiologists make the most precise evaluation of liver size, and CT and MR are the best methods because they are more objective and provide a complete and detailed view of the parenchyma. At the same time, ultrasonography image quality depends on the patient's cooperation during the examination and their nutrition level (van Randen *et al*., 2011). In daily radiological practice, the AP liver diameter is the most often measured diameter. However, all three diameters (AP, LL, and CC) should be measured, and the most reliable would be to determine the LV, which is still impossible to do routinely because it requires additional time and software tools. Namely, in cases of enlargement of only one diameter of the liver, while the remaining dimensions are within the reference range or significantly below the reference values, this should not strictly indicate hepatomegaly, and the individual characteristics of the patient, such as age, body parameters, laboratory findings, should also be taken into account (Nougaret *et al*., 2011). Our research supports these claims because we found that liver size is affected by sex, anthropometric parameters, as well as the age of the patients.

Although AP diameter is mainly used liver measure in clinical practice, our results showed that this diameter did not significantly correlate with any of the examined anthropometric parameters in men, and in women it correlated significantly only with BSA. At the same time, it is the only liver diameter that differed in our sample according to sex, and men had larger AP diameter (15.54±2.25 vs. 14.13±2.11 cm). On the other hand, Seppelt *et al*. (2022), found that AP diameter positively correlated with BMI in both sexes, and the same results were obtained by Guppta *et al*. (2008), who researched liver size on cadavers. Also, study of Kratzer *et al*. (2003), displayed that AP diameter positively correlated with BMI and BH.

When determining the size of the LL diameter of the liver, special care should be taken so that anatomical variations such as Beaver's tail type would not be declared pathological findings. In our study, all patients with anatomical variations were excluded. The value of LL diameter in our population did not differ in relation to sex, whereby in men, it positively correlated with BH (r=0.43) and BSA (r=0.31), while in women, it did not correlate with any of the examined anthropometric parameters. Also, this diameter in our patients of both sexes was well below the reference value of 23 cm (18.94±1.62 vs. 18.22±2.56 cm). Our results were in the line with the study of Ibrahim & Eyad (2018), who found 181.34±52.95 mm. In contrast, Seppelt *et al*. (2022), reported higher values (19.9±2.3 cm) but also in the reference range.

The size of the CC diameter is determined in the frontal plane, but it can be measured in several ways, namely: at the point of v. porta hepatis and the level of the midclavicular line, which represents our CCmcl diameter, then the maximum CC diameter can be determined by measuring the level of the most significant dimensions, which represents our CCmax diameter, and the oblique maximum CC diameter, which we did not measure, can also be determined. In our study, the CCmcl diameter did not differ between men and women. It is interesting that the size of this diameter positively correlated with BH both in men (r=0.33) and in women (r=0.38), which was expected considering that both parameters represent linear body measurement. Still, it was not affected by the difference in BH between the sexes although men were significantly taller than women. In men, its size correlated with BM (r=0.31) and BSA (r=0.33). Also, Guppta *et al*. (2008), confirmed a positive correlation between the size of this diameter and BM. Ibrahim & Ayad (2018) obtained values of 129.27±50.40 cm, while in our case, it was slightly lower for both men (11.07±2.07 cm) and women (10.83±1.95 cm). CCmax liver diameter also did not differ between men and women (15.62±2.37 vs. 15.57±2.21 cm). In men, it positively correlated with BH (r=0.36) and BSA (r=0.33), while in women, it did not correlate with any examined anthropometric parameter. Seppelt *et al*. (2022), determined the size of this diameter at the same level as we did, and reported higher values (17.2±2 cm).

Determining the LV is widely used in the preoperative preparation of patients for liver segmentectomies and transplants, as well as before cancer therapy with radioembolization (Vauthey *et al*., 2000; Linguraru *et al*., 2012), and also it can reduce the risk of complications in the case of the so-called small-for-size syndrome (Choi *et al*., 2017). On the other hand, some authors determined that LV does not necessarily correlate with its function, especially in patients with reduced LV (de Graaf *et al*., 2010a,b). In case of reduced liver size, should be performed detailed functional tests, in addition to determining the volume (Blann, 2014). Determining the LV is still not part of daily radiological practice; it requires special software tools, additional time, and radiologist training, and there is still an effort to find more straightforward parameters that correlate with the volume and whose values could quickly and reliably predict the liver volume itself. Some authors investigated whether the value of the diameter of the liver can also predict its volume, but they did not obtain significant results (Seppelt *et al*., 2022). We did not have software tools for volumetry. We calculated the LV using a formula (Verma *et al*., 2010; Ibrahim & Ayad, 2018), which may represent one of the weaknesses of our study because the data about LV obtained in this way are less precise than the computer-calculated volume. Still, on the other hand, they contribute to finding simple and fast diagnostic parameters for volume calculation in everyday practice. In our sample, men had a significantly larger LV (1435.73±374.35 vs. 1251.07±350.66 ml) than women. In both sexes, LV was positively correlated with BH and BSA, and in men, also with BM. Ibrahim & Ayad (2018) calculated the LV in the same way as we did, except that in their population, the average values were higher (1802.38±10.31 ml). An explanation for this difference in values could be that there were also patients with pathological findings of the liver in their sample, and changes such as tumors contributed to the larger volume. However, Sosna *et al*. (2022), calculated the LV using deep machine learning, and confirmed similar results (1533±375 ml). Andersen *et al*. (2000), used software to calculate the volume of normal livers, and they reported higher values for men (1831 ml), and also women (1398 ml). They pointed to correlation between LV and BM in both men and women. Gupta *et al*. (2008), found that LV correlated significantly with BSA. Sharma *et al*. (2016), reported that LV significantly correlated with BH, BM, BMI, and BSA. On the other hand, in other studies, they obtained smaller LV values than ours (Chandramonah *et al*., 2007; Verma *et al*., 2010).

In our research, BSA proved to be a handy parameter for assessing liver size, especially in men, where it correlated with all liver dimensions except AP diameter, and in women, it correlated with AP diameter and volume. On the other hand, BMI did not correlate with any examined anthropometric parameter in both sexes, even though the formula includes the same parameters as for BSA (BH and BM, corrected by the coefficient). However, in other studies, BMI significantly predicted liver size (Kratzer *et al*., 2003; Guppta *et al*., 2008; Seppelt *et al*., 2022).

We found that age had a significant negative correlation with all the examined liver dimensions (LL, CCmcl, CCmax, LV) in both sexes, except with AP diameter, where there was an insignificant positive correlation. Also, by dividing all patients into three age categories, we determined that AP and CCmcl diameter did not change significantly with aging. On the other hand, there was significant decrease in LL diameter according to age. Also, CCmax diameter as well as the LV first increased and then decreased with age, and this is in line with results obtained by Choukèr *et al*. (2004), who showed that sex does not influence liver dimensions, but age plays an important role. They pointed out that the dimensions of the liver increase with age, reaching a maximum between 41 and 50 years in men and between 51 and 60 years in women, and that they decrease again after that period. On the other hand, Kratzer *et al*. (2003), and Patzak *et al*. (2014) reported that the CC diameter increases with aging. Sharma *et al*. (2016), found in their sample that there is a linear decrease in liver volume with aging and that the largest volume was found in people between 21 and 25 years. In our sample, in age category <40 years was the smallest number of patients, and it was expected, because they more often go to the MRI than to CT, and the main reason is exposure to the radiation during CT imaging.

Based on the results of our study we can conclude that average value of AP diameter in our population was 14.83±1.28 cm, of LL diameter it was 18.58±2.17 cm, of CCmcl diameter it was 10.95±2.01 cm, and of CCmax diameter it was 15.59±2.28 cm. In men, the most significant anthropometric parameters were BH and BSA, and they positively correlated with LL, CCmcl, CCmax diameters as well as with LV. Also, BM positively correlated with CCmcl diameter and LV in men. On the other hand, in women the correlation between liver dimensions and anthropometric parameters was not as significant. BSA positively correlated with AP diameter and LV, and BH positively correlated with CCmcl and LV. We found the above to be particularly important since methods of anthropometric measuring are non-invasive, do not demand expensive equipment, and enable individual access to liver size both in men and women. In the future, the sample should be expanded in order to obtain even more representative values.

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RESUMEN: El hígado desempeña más de 500 funciones fisiológicas y bioquímicas en nuestro organismo, por lo que comprobar el tamaño y la función de este órgano es parte de cada examen clínico. El objetivo de nuestra investigación fue estimar el tamaño del hígado mediante tomografía computarizada (TC) de imágenes del abdomen y determinar las relaciones entre las dimensiones del hígado y los parámetros antropométricos. La investigación incluyó a 99 pacientes, 49 hombres y 50 mujeres, que fueron remitidos para TC de abdomen. Medimos la altura corporal (BH) y la masa corporal (BM), y calculamos el índice de masa corporal (IMC) y el área de superficie corporal (BSA). Además, en las imágenes de TC medimos los diámetros hepáticos anteroposterior (AP), laterolateral (LL) y dos craneocaudales (uno a nivel de la línea medioclavicular - CCmcl, y el diámetro máximo - CCmax). El volumen del hígado (VI) se calculó con una fórmula. Nuestros resultados mostraron que el diámetro AP se correlacionó positivamente con BSA (r = 0,30) en mujeres. El diámetro de LL se correlacionó positivamente con BH (r=0,43) y BSA (0,31) en hombres. El diámetro CCmcl se correlacionó positivamente con BH (r=0,33), BM (r=0,31) y BSA (r=0,34) en hombres, mientras que en mujeres se correlacionó solo con BH (r=0,38). El diámetro CCmax se correlacionó positivamente con BH (r=0,33) y BSA (r=0,33) en hombres. El VI se correlacionó positivamente con BH y BSA tanto en hombres (r=0,36, r=0,33, respectivamente) como en mujeres (r=0,42, r=0,31, respectivamente), y en hombres también con BM (r=0,34). LL, CCmcl, CCmax y LV se correlacionaron negativamente con el envejecimiento en ambos sexos. Después de los 60 años, hubo una disminución en el tamaño de los diámetros LL, CC y LV. Concluimos que las dimensiones del hígado disminuyen con la edad, independientemente del sexo, en la extensión de los diámetros LL y CC que están relacionados con el tamaño de los parámetros corporales, por lo que para una evaluación precisa del tamaño del hígado se debe medir LV como BH, BM y BSA.

PALABRAS CLAVE: Diámetros del hígado; Peso corporal; Masa corporal; Superficie del cuerpo; Tomografía computarizada.

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