USG BASED STUDY OF DIMENSION OF LEFT LOBE OF LIVER AND ITS CORRELATION WITH AGE AND GENDER

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INTRODUCTION- The liver is the largest organ in the body. It is essential for life, performing several diverse and complex functions in the human body. It is situated at the right upper quadrant of the abdomen underneath the lower ribs. It extends approximately from the 6th rib down the right costal margin. This makes it difficult to palpate the whole organ in clinical examination Clinically, the liver size is determined by palpating and percussing the right hypochondrium and measurement made in centimetres below the costal margin. A normal sized liver may be felt below the right costal margin which does not mean that it is enlarged. Therefore this method has been found to be subjective in determining liver size.

A more accurate, reliable and reproducible method of determining the liver size is by imaging. Techniques such as ultrasonography, magnetic resonance imaging, computerised tomography and plain film radiography have been used. Ultrasound is a non invasive, reliable and cheap modality of imaging the liver without the use of ionizing radiation.

Ultrasonography is the use of high frequency sound of about 2-15MHz (in medical imaging) to visualise both deep and superficial organs of the body. It involves the transmission of this high frequency sound and relies on the reception of the reflected sound waves (echoes) via a transducer. Transmitted sounds are displayed as real time images in the B- mode. Ultrasound is the imaging modality of choice in investigating the liver and the biliary system, and is especially able to differentiate between solid and cystic lesion.

Various dimensions which include the cranio-caudal length, antero-posterior, and transverse diameters can be measured during ultrasonography. These measurements could be used to calculate the volume of the liver. Ultrasonography also has the advantage of evaluating other abdominal organs at the same time. When scanning, the liver, the billiary system can also be assessed. The echo-texture during the examination is compared, with that of the kidneys, pancreas, and spleen.

Anthropometrically the liver size is said to be influenced by height, weight, and body mass index. Alcohol consumption, and other pathological conditions like cirrhosis (of any cause), tumours (e.g hepatoma, lymphoma, metastasis); malaria, miliary tuberculosis, amyloidosis, syphilis, storage disorders, congestive cardiac failure may also cause an enlarged liver.4

A diseased liver may be enlarged or shrunken depending on the nature and chronicity of the disease.An enlarged liver usually does so by extending downwards (caudally). Hence measuring the cranio caudal length (span) of the liver at a reference point (e.g. mid clavicular line) will aid in detecting hepatomegaly.

Since a diseased liver could be enlarged or shrunken, it is important that a standard range of values for normal liver size be established in our own environment. It is for this purpose that this project is embarked on.

Anatomy of the Liver

The liver is found in the right upper quadrant and extends variably to part of the left upper abdomen. Its upper border lies between the fifth and sixth ribs and the lower border can sometimes be palpated below the right costal margin.

It is about 1/18th (one-eighteenth) of an infant's total body weight and 1/36th (one-thirty-sixth) of an adult's. The exact weight of the normal liver varies, but ranges from 1.2kg in adult women to 1.6kg in men. It varies somewhat in shape, topography and vascular disposition, depending on individual morphology. Generally, the liver assumes the shape of the cavity it occupies; a shape that is unrelated to its function.

The liver is an intraperitoneal organ completely covered by a dense, fibro elastic, connective tissue layer called the Glisson's capsule which contains blood and lymphatic vessels and nerves; and is almost completely covered by peritoneum.It has a diaphragmatic and posterio-inferior or visceral surfaces. The diaphragmatic surface is smooth and divided into a flat posterior, anterior and superior surface with a large dome for the right hemidiaphragm and a smaller dome for the left hemidiaphragm. A depression between these, marks the site of the central tendon and the overlying heart.

The posterio-inferior or visceral surface is concaved, marked by an 'H' – shaped arrangement of fossae. The horizontal line of the 'H' is formed by the porta hepatis where the right and left hepatic arteries and portal veins enter the liver and the right and left hepatic ducts exit.

Aim and objective-

To measure dimension of left lobe of liver by USG and correlate with the age and gender.

- **Materials and method**- This study has been conducted in anatomy department in collaboration with radiodiagnosis department of L. N. medical college, & j.k. Hospital,kolar road, Bhopal. Craniocaudal length of left lobe of the liver is measured through. Demographic data such as age and gender of subjects are recorded by designed formet. The sample size of this study is 642 normal healthy individuals without any liver disease. USG has been done on model - WIPRO GE (VERSANA PRIMER) 6040878WXO

Inclusion criteria-Age of the subjects are between 18-60 years. Only normal healthy individuals are included in this study, both male and female subjects are included in this study

Exclusion criteria-: Those individuals who are suffering from liver disease, diabetes mellitus, renal disease, hypertension, cardiac disorder, alcoholic, obesity, are not included in the study.

OBSERVATIONS AND RESULTS-

Table.1: Association of CCL of LT lobe with age- groups of subjects under consideration.

Age-groups	Gender	N	Mean±SD	Sig. Value
20-30	Male	137	5.50±0.41	0.00*
	Female	193	5.34±0.42	
31-40	Male	90	5.58±0.43	
	Female	128	5.50±0.42	
41-50	Male	45	5.43±0.41	
	Female	41	5.45±0.21	
51-60	Male	3	5.63±0.24	
	Female	5	5.25±0.28	

*Significant at α=5%

Mean±SD of craniocaudal length of left lobe in male were maximum in age group 51-60yrs (5.63±0.24). and in female it were maximum in age group 31-40yrs (5.50±0.42). The minimum Mean±SD of ccl of left lobe were in age group 41-50yrs for male (5.43±0.41). and age group 51-60yrs for female (5.25±0.28). Here the result showing that there is a significant difference between age groups for ccl left lobe at 5% level of significance (p=0.00).

TABLE.2. Association of CCL OF LT lobe with Gender.

Gender	N	Mean±SD	Sig.Value
Male	275	5.52±0.41	0.00
Female	367	5.40±0.40	

Mean±SD of craniocaudal length of left lobe of the liver of male is 5.40±0.40 while for female it is 5.52±0.4, which is slightly more that male subjects under consideration. There is significant difference between male and female at 5% level of significance (p= 0.00) for craniocaudal length of left lobe of the liver which has been shown in the table (table.2).

DISCUSSION-

The traditional methods of palpation and percussion in determining liver size have been found to be subjective and therefore imaging has been relied upon to provide accurate means of determining enlargement of liver. Ultrasound is cheap readily, available, easy to perform, and can be carried out easily in the clinical setting.

the result of this study is also same as some study was previously done as a study was conducted by clause niederue in 1983 among 1000 consecutive blood donors and examined by ultrasoun. There were 160 women and 840 men between the age of 18-65 years of the age, sex, age, weight, height, body surface area. The result showed that mean value standard deviation and upper normal limit of all the diameters were correlated with the physical parameters. The diameter were smaller in women than in men and demonstrated a positive correlation with age.

Another study was conducted by singh k.et al 1985 among 1107 individuals in the age group 8 days to 75 years and the liver span was correlated to height, weight and age. The liver span was independently estimated through radiological examination. The liver span showed significant correalation to age.

A comparative study was conducted by kartzar walfgang et al 2003 to determine the size of the liver in selected population sample and the potential factors influencing the liver size. A total of, 2080 (983 male and 1097 females) underwent ultrasound examination, physical assessment and standardized interview questionnaire. Result of multivariate analysis showed that the factors like sex and age exerts an influence over liver size measured at midclavicular line.

A cross sectional study also was conducted by dhingra b. sharma s.et al 2009 among 597 healthy children between the ages of 1 month to 12 years. Ultrasonographic evaluation for the assessment of liver and spleen size done. These were correlated with the age, sex, height/length and weight of the participants. Normal liver and spleen length and range were obtained sonographically.

CONCLUSION-

Correlation between craniocaudal length of left lobe of liver and age of subjects is significant at 5% level of significance. Correlation between craniocaudal length of left lobe of liver and gender of subjects is significant at 5% level of significance, (p=0.00).

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