

Ultrasonographic Measurement of Splenic Length In Relation To Age of Adult's in Manipur

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Abstract: Spleen one of the most important lymphoid organs shows variations in size or length in different stage of life. Knowledge of splenic size can help us to diagnose many different kinds of diseases. This study is to establish the normal range of splenic length in correlation to the age of individual in both males and females by ultrasound examination which is one of the most common routine clinical examination now a days.

200 subjects were examined - 84 males and 116 females who are known to be not suffering from hemorrhagic disorders, tropical diseases, Leukemias etc which can cause enlargement of the spleen. The length of the spleen from the superomedial to inferolateral ends are measured at the level of the hilum. It was concluded that the splenic length decrease with increase of age. Males have longer spleen than females.

I. Introduction

The spleen is the largest lymphoid organ in the body. It lies under the diaphragm on the left side of the abdomen(1). The Spleen is an organ found virtually in all vertebrates. The spleen consist of large encapsulated mass of vascular and lymphoid tissue situated in the upper left quadrant of the abdominal cavity between fundus of stomach and diaphragm(2).

The spleen is a mobile organ resting on the left colic flexure. It is associated posteriorly with the left 9th-11th ribs(its long axis is roughly parallel to the 10th rib).

The relation of the spleen are the stomach anteriorly, left part of the diaphragm posteriorly, left colic flexure inferiorly and the left kidney medially.

The spleen varies considerably in size. It is 1 inch thick, 3 inches wide, 5 inches long, and weighs 7 ounces. Spleen is directly connected to the stomach by the gastrosplenic ligament and to the posterior body wall and left kidney by lienorenal ligament(3). Ultrasonography is a good modality for the detection of splenomegaly even when it is not clinically palpable. Ultrasonography is routinely used to evaluate the abdominal organs because it does not use ionizing radiation and is not invasive. Moreover, it is safe, provides real time images and does not require anaesthesia. Furthermore during the follow up examination, repeat sonography can be safely done (4).

The estimation of the splenic size in vivo is often important in the diagnosis, treatment and prognosis of variety of disorders.

Spleen size varies widely according to age. The precise measurement of the spleen by palpation is not reliable, since in some of the cases a normal sized spleen is palpable whereas a non palpable spleen is not always normal sized. The spleen is an intra-abdominal organ that is affected by several diseases. Spleen enlarges in a variety of clinical conditions, most often due to reactive proliferation of lymphocyte or reticuloendothelial cells, malignancies of hematopoietic system such as Lymphoma and conditions related to Portal hypertension, disseminated TB, Malaria, Kala-azar, Cirrhosis etc..(5).

II. Materials And Methods

200 patients - 84 males and 116 females of the age 21-70 years attending the department of Radiodiagnosis, Regional Institute of Medical Sciences, Imphal were screened by taking history and physical examination to exclude splenomegaly who were referred for some other complaints like pain abdomen, gastritis, colitis, urinary problem or gynecological problems etc were examined by Medison SONOACE X8 ultrasound machine using 3.5 curvilinear probe. The patients were asked to lie in right lateral decubitus position. The distance between the most superomedial and inferolateral margins of the spleen, at the level of hilum is measured.

III. Observations And Results

Total subjects: 200- 84 males and 116 females

Age : 21 to 70 years.

Males: Mean age : 45.99yrs (± 13.38 SD),
 Mean SL : 9.49cm (± 1.24 SD).

Females: Mean age : 39.70yrs (± 12.26 SD),
 Mean SL : 8.62cm (± 1.36 SD).

MALE				FEMALE		
AGE	Nos	SL Range (Cms)	Mean(Cms) +/- SD	Nos	SL Range (Cms)	Mean(Cms) +/- SD
21-30	10	8.21-10.96	9.81 \pm 0.90	32	6.33-11.81	8.83 \pm 1.30
31-40	26	7.13-11.53	9.27 \pm -1.17	35	6.92-11.04	8.73 \pm - 1.10
41-50	16	7.80-10.63	9.22 \pm -0.87	28	5.61-11.26	8.63 \pm - 1.26
51-60	18	6.13-11.25	8.91 \pm -1.31	16	5.43-11.76	8.54 \pm - 1.85
61-70	14	6.45-11.36	8.59 \pm -1.35	5	5.58-7.37	6.60 \pm - 0.76

Table 1: Comparison of splenic length with age in males and females.

As seen from the above table, the splenic length decrease with increase of age of individual. It also shows that the males have longer spleen than females.

IV. Discussions:

Ezeofor SN et al concluded that there is a significant correlation between splenic length and age of individual. And also shows that Males has statistically significant longer spleen length than females.(4). The present study similarly concluded that there is a correlation of the splenic length and age of individual. The splenic length decreases with increase with age of an individual. The present study also shows that males have longer spleen than females in the same age group as seen in Table 1.

Yadav BK et al shows that length, width and thickness of spleen were reduced with increasing age in both males and females which corresponds to the present study as seen in table 1.

According to Megremis SD et al, Arora N et al and Mittal R et al, the splenic length correlates with age of individual and splenic length is more in males than in females, which corresponds to the present study (5,6,7,8,9).

Machalek et al also concluded that length of the spleen is higher in men than in women which is similar to the present findings.(10).

Salam GA et al concluded that the spleen length showed their highest correlation coefficient with age which is also similar to this study(11).

Arora N et al shows that the splenic length reduces with increase in age in both males and females which is again similar to this present findings.

Also Loftus WK and Metrewali C shows that there is decrease in splenic length after the age of 20 years and the finding that spleen of men are larger than those of women which is similar to the present study(13).

V. Conclusions:

- The present study shows that from the age of 21 years and above, the splenic length gradually decreases in both males and females.
- The present study also shows that the splenic length is more in males than in females in the same age group.

References

- [1]. Sinnatamby CS. Abdomen. In: Last's Anatomy: Regional and Applied. 12th ed. Edinburgh: Elsevier Limited; 2006. p.270
- [2]. Borley NR. Grays anatomy: The anatomical basis of clinical practice. Spleen. In: Stranding S, Ellis H, Heally JC, Johnson D, Williams A, Collins P, editors. 40th ed. Spain: Elsevier; 2008. p. 1191
- [3]. Larsen WJ. Anatomy: Development, Function, Clinical correlation. Philadelphia: Elsevier Science; 2002. p. 228.
- [4]. Ezeofor SN, Obikili EN, Anyanwu GE, Onuh AC, Mgbor SO. Sonographic assesment of the normal limits of the spleen in healthy school children in South east Nigeria. Niger J Clin Pract 2014 Aug;17(4):484-86.
- [5]. Yadav BK, Sharma LK, Yadav SR, Chakradhar S, Neupane I. Sonographic measurements of the spleen in relation to Age; A prospective study in eastern nepalese adults. JBPR 2012;2(3):118-21.
- [6]. Megremis SD, Vlachonikolis IG, Tsilimigaki AM. Spleen length in childhood with US: Normal values based on age, sex and somatometric Parameters. RSNA 2004 Apr;231(1):129-34
- [7]. Arora N, Sharma PK, Sahai A, Singh R. Sonographic measurement of the spleen in relation to age; A prospective study in North Indian Adults. J Anat. Soc. India 2010;59(2):177-181.

- [8]. Mittal R, Chowdhary. A pilot study of the normal measurements of the liver and spleen by ultrasonography in the Rajasthani population. *Journal of Clinical diagnostic and research* 2010 Aug;(4):2733-36.
- [9]. Udaoka AI, Enyi C, Agi CE. Sonological Evaluation of the liver,spleen and the kidneys in an adult southern Nigerian population. *Asian journal of Medical sciences* 2013;5(2):33-6.
- [10]. Machalek L, Holibkova A, Tuma J, Houserkova D. The size of the splenic Hilus, Diameter of the splenic artery and its branches in the human spleen. *Acta Univ. Palacki. Olomuc., Fac. Med* 1998;141:45-8.
- [11]. Salam GA, Mehlab E, Ali AM. Ultrasonographic estimation of age-dependent changes in length of spleen and hepatic lobes and diameters of portal vein and common bile duct in children. *J Am Sci* 2013;9(1):31-8.
- [12]. Arora N, Sharma PK, Sahai A, Singh R. Sonographic measurement of the spleen: Splenic length in adults and its correlation with different paramaters. *J Anat Soc India* 2013 Jun;62(1):57-61.
- [13]. Loftus WK, Metrewali C. Normal splenic size in a Chinese population. *J Ultrasound Med* 1997;16:345-347