

ROLE OF ULTRASOUND IN INFLAMMATORY DISEASES OF LIVER IN TROPICAL PAEDIATRICS POPULATIONAjay Kumar¹, G. N. Singh²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: Paediatric population suffering from inflammatory diseases of liver develops inflammation and fibrosis. Inflammation may precede steatosis. Steatohepatitis subsequent to simple steatosis may be the consequence of a failure of antilipotoxic protection. Many parallel hits derived from the gut and/or the adipose tissue may promote liver inflammation. Endoplasmic reticulum stress and related signaling networks, (adipo) cytokines, and innate immunity are emerging as central pathways that regulate key features of steatohepatitis.

KEYWORDS: Inflammatory, immunodeficiency, necrosis, echogenicity, pyogenic, septicemia, omphalitis, parasitic, immune compromised, hypoechoic, granulomatous, phagocytized, serological, histological.

INTRODUCTION: Inflammatory diseases of liver are major cause of mortality and morbidity in tropical paediatrics population. These groups of patients present abdominal pain/tenderness, fever, hepatomegaly and elevated liver function test, in whom the clinical and laboratory features are non-diagnostic and imaging features are very important in reaching diagnosis and hence forth effective treatment either with surgery or medication. Ultrasonography plays a major role in imaging this group of patients and for reaching proper diagnosis.

The various causes of inflammatory lesion of liver common in tropical paediatric population are:

- a. Viral hepatitis.
- b. Pyogenic abscess.
- c. Echinococcal disease.
- d. Amebic abscess.
- e. Fungal abscess.
- f. Chronic granulomatous disease.
- g. Acquired immunodeficiency syndrome.

CASE SERIES:

CASE-1: A eight year old girl had fever and pain in right upper abdomen since days. On examination of his abdomen the liver was enlarged and spleen was normal. The sonographic finding showed enlarged liver having coarse echotexture and increased echogenicity. (Fig -1).

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Fig. 1: Liver showing hepatitis (coarse parenchymal echotexture).

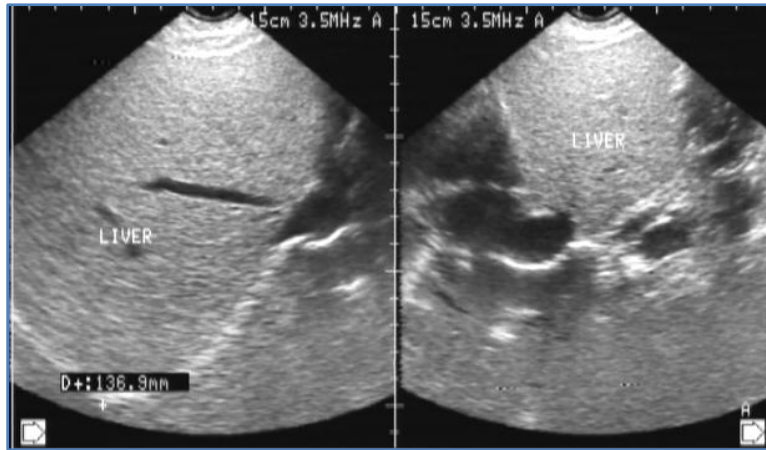


Fig.1

CASE-2: A eleven year old boy had high fever and severe pain abdomen since 1week. On examination the abdomen was very tender in the right upper quadrant near the rib margin. The sonographic finding showed enlarged liver with hypoechoic cystic lesions with debris inside them suggestive of abscesses. (Fig. 2).

Fig. 2: Pyogenic Abscesses.

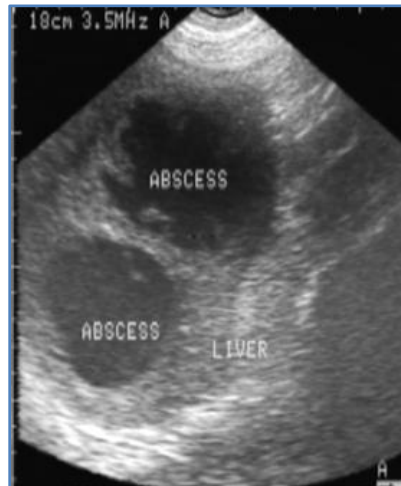
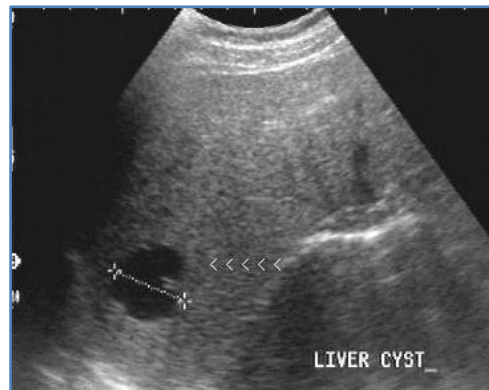


Fig. 2

CASE-3: A nine year old boy complained of pain abdomen. On abdominal examination the liver appeared to be mildly enlarged rest of the organs were found to be normal. The sonographic finding revealed the liver to be mildly enlarged with a single hypoechoic cystic area finding suggestive of simple cyst. (Fig. 3)

Fig. 3: Liver showing a simple cyst.**Fig. 3**

DISCUSSION: Viral hepatitis defined as diffuse infection of liver parenchyma and characterized by inflammation and hepatic cell necrosis. Almost all cases are of viral origin (i.e., from Hepatitis A to Hepatitis E).

Sonography is useful when there is clinical uncertainty, appearance may be normal but with severe parenchyma damage, findings include hepatomegaly, decreases parenchymal damage, findings include hepatomegaly, decreased parenchymal echogenicity and increased echogenicity of portal venule walls (starry sky liver), mural thickening of G.B. wall, small G.B. with sludge and enlarged porta-hepatis nodes. In chronic cases the echogenicity of hepatic. Parenchyma increases and the echotexture become coarse.^[1]

PYOGENIC ABSCESS: Hepatic abscess develop secondary to seeding from generalized septicemia, omphalitis or intestinal source. The common causative agent in neonates is E. Coli and in infants and children is staphylococcus aureus. Pyogenic abscess can occur in any part of liver, but 80% in posterior part of right lobe. Tend to be predominantly hypoechoic masses with thick walls and varying degrees of through transmission, septations, debris and fluid-fluid levels are common. Gas containing lesions are hyperechoic and demonstrate distal acoustic shadowing^[2].

ECHOINOCOCCAL DISEASE: Is a parasitic infestation caused by the larval stage of tapeworm E.granulosus or E.alveolaris through ingestion of contaminated food. Liver is affected most commonly although lungs, spleen, kidneys, CNS and bone can be involved. Sonographic feature of liver hydatid disease include simple cyst, complex cyst with multiple internal daughter cysts, echogenic septa, debris or floating membrane, simple or complex cysts with wall classification^[3].

AMOEBIC ABSCESS: Is caused by parasite Entamoeba histolytica & hepatic abscess is the most common extra intestinal complication. Sonographic features include solitary (80%) lesion, peripheral location in the right lobe of liver near the dome, mainly hypoechoic masses containing fine low level echoes.^[4]

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FUNGAL ABSCESS: Almost always in immune compromised patients, candida albicans is the most common fungal organism. They more commonly cause multiple small lesions several millimeters in diameter with irregular walls, scattered through-out both lobes of liver and often involving spleen and occasionally kidney. Sonographic features include small round hypoechoic lesions, wheel within a wheel pattern, the bull's eye pattern and complete hyperechogenicity, representing different stages of evolution.^[5]

CHRONIC GRANULOMATOUS DISEASE: Is an X linked recessive disease characterized by inability of the leukocytes to lyse phagocytized bacteria Patient with recurrent infection of liver, lungs, bone, lymph nodes often due to S. aureus or E. coli. Sonography shows single or multiple poorly marginated hypoechoic lesions with or without distal acoustic shadowing ^[6].

ACQUIRED IMMUNODEFICIENCY SYNDROME: These patients are at risk of variety of infections of the liver and biliary tract. The common infectious agents are pneumocysticcarini, CMV, MAI, Sonography shows hepatomegaly, hypoechoic or hyperechoic parenchyma, periportal hyperechogenicity and focal mass lesions.^[7]

CONCLUSION: Thus patients presenting with fever, upper abdominal pain/tenderness, hepatomegaly and elevated liver function test, in whom the diagnosis is uncertain, ultrasonography plays a major role in narrowing the diagnosis and along with serological and histological parameters, helps in confirming diagnosis and there by starting proper therapy and hence forth reducing mortality and morbidity in pediatrics population.

REFERENCES:

1. Marilyn J.Siegd Paediatric Sonography; 3rd ed.
2. Collins, Arthur N. Abscess of the liver. Minnesota Med. 1932; 15: 756.
3. Kalinova K 2007. Imaging Blug J. Vet. Med. 10 No. 1, 45-51
4. Donnelly JP, Blijlevens NMA, DePauw BE. Entamoeba species including amebiasis. In: Mandell GL, Bennett JE, Dolin R, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Disease. 7th ed. Philadelphia, Pa.: Elsevier Saunders; 2009:chap 273
5. Carol M. Rumack. Diagnostic Ultrasound; 3rd ed.
6. Nakanuma, Y, Liew, CT, Peters, RL et al. Pathologic features of the liver in acquired immunodeficiency syndrome (AIDS). Liver. 1986; 6: 158-
7. Carson M. J, Chadwick,D. L. Brubaker, C.A. Cleland,R.S., and Landing,B. H.granulomatosis, Paediatrics 35: 405-412,1965

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