

Prevalence and Clinico-diagnostic Profile of Hepatosplenomegaly in Children Admitted at a Tertiary Center in Kathmandu

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ABSTRACT

Background: Hepatomegaly, hepatosplenomegaly or splenomegaly are clinical findings that can indicate a wide range of underlying conditions. Their causes are enteric fever, hepatitis, scrub typhus, acute liver failure, and leukemia. The aim of this study was to determine the prevalence of hepatomegaly, hepatosplenomegaly, and splenomegaly in admitted children along with various clinical features and diagnoses associated with them.

Methods: A hospital-based descriptive cross-sectional study was done. The total enumeration sampling technique was used to enroll children aged one month to fourteen years admitted in pediatric ward. Informed consent was obtained from the parents and assent was taken in children more than seven years. Data were collected with proforma and entered in Microsoft excel 2016, transferred to SPSS 16 and Descriptive analysis was done.

Results: Among 728 children admitted, 72 had either hepatomegaly, hepatosplenomegaly or splenomegaly with an overall prevalence of 9.89%. The majority (65.3%) had hepatomegaly, 30.55% had hepatosplenomegaly and 4.15% had splenomegaly. The prevalence of hepatomegaly, hepatosplenomegaly and splenomegaly were 6.46%, 3.02%, and 0.41% respectively. Infection was the most common cause of and fever was the most common presenting symptom in both hepatomegaly and hepatosplenomegaly.

Conclusion: Hepatomegaly and hepatosplenomegaly are relatively common in children, often due to systemic infection. Splenomegaly usually occurs simultaneously with hepatomegaly; however, isolated splenomegaly can occur in a few cases. An awareness program about basic hygiene practices, vaccination, safe drinking water, and proper food handling can reduce the risk of infections like enteric fever. Meticulous history, relevant physical examinations, and laboratory investigations can steer us towards early diagnosis and timely management of the patient.

Keywords: enteric fever, hepatomegaly, hepatosplenomegaly, scrub typhus, splenomegaly

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INTRODUCTION

Hepatomegaly, hepatosplenomegaly or splenomegaly can indicate a wide range of underlying conditions. Hepatomegaly is the enlargement of liver and hepatosplenomegaly is the concurrent enlargement of liver and spleen. They are relatively common physical findings seen in children having various diseases. Some of the etiologies are encountered frequently like enteric fever while others may be serious and life threatening like acute liver failure and leukemia [1]. Normal liver size estimations are based on age related clinical indices such as the degree of clinical extension of the liver edge below the right costal margin, the span of dullness to percussion, or the length of the vertical axis of the liver, and estimation from imaging techniques. Splenomegaly refers to the enlargement of spleen beyond its normal size [2]. A pathologically enlarged spleen is often firm, may have an abnormal surface, and is frequently associated with signs and symptoms of the underlying disease [3,4]

A study done by Champatiray et al. [5] found infectious (50%) causes as the commonest etiology of hepatosplenomegaly followed by hematological (36%) and congestive (6%) causes. Anemia (79.3%) was the most common presentation followed by fever (78%) and jaundice (38.7%). Similarly, Anusha et al. [6] found fever (80.7%) as the common presenting followed by anemia (66.67%) and jaundice (37.33%). Another study done by Ali N et al. [7] found hematological malignancies (18%) as the most common cause of splenomegaly in children followed by beta-thalassemia (55%), other hemolytic anemia (13.5%), congenital sideroblastic anemia (4.5%), and storage disorder (9%).

Very few studies have been done regarding the prevalence, etiological, and clinical profile of hepatomegaly, hepatosplenomegaly, and splenomegaly in Nepal. Therefore, we aim to determine the prevalence of hepatomegaly, hepatosplenomegaly, and splenomegaly along with its etiological and clinical profile.

METHODS

This was a hospital-based cross-sectional observational study done on the children admitted in the pediatric ward of Kathmandu Medical College after obtaining ethical approval from the Institutional Review Committee and Head of Department. Informed consent was taken from guardians of all the children, and assent was taken from children above seven years of age before enrolling in the study. Total enumeration

sampling technique was used including the admitted children from 1st January 2020 to 30th June 2021. Children of age one month to 14 years, having either hepatosplenomegaly, hepatomegaly or splenomegaly were included in this study. The patients with liver cirrhosis, chronic liver disease, bronchiolitis, asthma and severe chest wall or spine deformity were excluded.

Demographic parameters like age and sex along with clinical pattern of the diseases were recorded. Relevant history and physical examination were performed. Diagnostic laboratory investigations were done as needed to rule out causes of the diseases. Liver span and spleen size were estimated by palpation, percussion and ultrasound examination [8]. Hepatomegaly and splenomegaly were defined when the liver and spleen span were more than expected for the corresponding age [9]. Data were collected using proforma and entered into Microsoft Excel 2016 and transferred to SPSS version 16 for analysis. Frequencies and percentages were calculated for categorical data whereas mean and standard deviations were computed for the continuous variables.

RESULTS

During the study period, a total 728 children were admitted, among which 72 children had either – hepatosplenomegaly, hepatomegaly or splenomegaly. The male: female ratio was 1:1. The mean age of presentation was 5.78 years with standard deviation of 4.20 years. More than half 39(54.17%) were in the age group 1 month - 5 years, followed by 6-10 years 20(27.77%), and 11-14 years 13(18.06%). Among total cases, there were 65.3% hepatomegaly, 30.55% hepatosplenomegaly, and 4.15% cases of splenomegaly. The prevalence of hepatomegaly, hepatosplenomegaly, and splenomegaly were 6.46%, 3.02%, and 0.41% respectively. The overall prevalence was 9.89%. (Table 1).

Fever (83.3%) was found to be the most common overall clinical presentation followed by vomiting (41.6%) and anemia (36.1%). Other presenting clinical features were abdominal pain, jaundice, lethargy, abdominal distension, ascites, altered sensorium, loose stool, weight loss, and edema (Table 2). Infectious diseases were the most common cause in all three categories: hepatomegaly, hepatosplenomegaly and splenomegaly with 48.61%, 19.44% and 2.77% of cases respectively. It accounted for 70.83% of the total cases. (Table 3).

Table 1: Prevalence and demographic distribution of hepatomegaly, hepatosplenomegaly, & splenomegaly

Patient admitted		Sex		Total	Prevalence
		Male	Female		
Hepatomegaly	1mo to 5years	13	14	27	3.71%
	6 to 10 years	10	7	17	2.33%
	11 to 14years	1	2	3	0.41%
Total		24	23	47	6.46%
Hepatosplenomegaly	1mo to 5years	6	4	10	1.37%
	6 to 10 years	2	1	3	0.41%
	11 to 14years	3	6	9	1.24%
Total		11	11	22	3.02%
Splenomegaly	1mo to 5years	0	2	2	0.27%
	6 to 10years	0	0	0	0
	11 to 14years	1	0	1	0.13%
Total		1	2	3	0.41%
Total cases	1mo to 5years	19	20	39	5.35%
	6 to 10 years	12	8	20	2.74%
	11 to 14years	5	8	13	1.78%
Total		36	36	72	9.89%

Table 2: Clinic-diagnostic profile distribution (N=72)

Symptoms	Hepatomegaly	Hepatosplenomegaly	Splenomegaly	Total (%)
Fever	43 (59.72%)	15 (20.83%)	2 (2.78%)	60 (83.33%)
Vomiting	21 (21.17%)	9 (12.50%)	0 (0%)	30 (41.67%)
Anemia	14 (19.44%)	10 (13.89%)	2 (2.78%)	26 (36.11%)
Abdominal pain	17 (23.61%)	5 (6.94%)	0 (0%)	22 (30.55%)
Jaundice	12 (16.67%)	9 (12.50%)	0 (0%)	21 (29.1%)
Lethargy	7 (9.72%)	7 (9.72%)	1 (1.39%)	15 (20.83%)
Abdominal distension	4 (5.55%)	7 (9.72%)	1 (1.39%)	12 (16.66%)
Ascites	6 (8.33%)	2 (2.78%)	0 (0%)	8 (11.11%)
Altered sensorium	3 (4.16%)	5 (6.94%)	0 (0%)	8 (11.11%)
Loose stool	5 (6.94%)	1 (1.39%)	0 (0%)	6 (8.33%)
Weight loss	3 (4.16%)	3 (4.16%)	0 (0%)	6 (8.33%)
Edema	2 (2.78%)	1 (1.39%)	0 (0%)	3 (4.16%)

Table 3: Etiological Distribution by Age Group (N=72)

Causes	Number of cases									Total (%)
	1mo to 5yrs			6 to 10yrs		11 to 14yrs			H+HS+S	
	H	HS	S	H	HS	H	HS	S		
Infective	17	5	1	15	2	3	7	1	51 (70.83%)	
Enteric fever	11	0	0	8	1	0	1	0	19+2+0=21	
Hepatitis	2	1	0	3	0	1	3	0	6+4+0=10	
Scrub typhus	1	2	1	0	1	0	3	1	1+6+2=9	
Dengue	2	0	0	3	0	1	0	0	6+0+0=6	
CMV	1	2	0	0	0	0	0	0	1+2+0=3	
Hydatid cyst	0	0	0	1	0	0	0	0	1+0+0=1	
Leptospirosis	0	0	0	0	0	1	0	0	1+0+0=1	
Hematologic	1	4	0	1	0	0	0	0	6 (8.33%)	

Thalassemia major	1	4	0	0	0	0	0	0	1+4+0=5
Acute leukemia	0	0	0	0	1	0	0	0	0+1+0=1
Congestive	8	0	1	1	0	0	0	0	10 (13.89%)
Cardiac failure	7	0	0	1	0	0	0	0	8+0+0=8
Portal hypertension	1	0	1	0	0	0	0	0	1+0+1=2
Genetic / metabolic disorder (Wilson's Disease)	0	0	0	0	0	1	0	0	1 (1.39%)
Miscellaneous	2	0	0	1	0	1	0	0	4 (5.56%)
Acute liver failure	1	0	0	1	0	0	0	0	2+0+0=2
Failure to thrive	1	0	0	0	0	0	0	0	1+0+0=1
Hepatoblastoma	0	0	0	0	0	1	0	0	1+0+0=1
Total	28	9	2	18	2	5	7	1	72 (100%)

H= Hepatomegaly; HS= Hepatosplenomegaly; S= Isolated splenomegaly

DISCUSSION

Hepatomegaly and hepatosplenomegaly are a relatively common physical finding in many diseases. Though isolated splenomegaly is less common, it can occur in few instances. In our study, both hepatomegaly and hepatosplenomegaly were found most commonly in age group one month to 5 years. This finding is similar to that of Bricks LF et al [10].

This study revealed the most common clinical feature associated with hepatomegaly and hepatosplenomegaly was fever and the same was found by other studies as well [5,6,10]. It can be explained with infective etiology that led our table. Besides fever, vomiting, anemia, abdominal pain and jaundice were other important clinical features in children with hepatomegaly and hepatosplenomegaly. Champatiray et al. [5] also noted similar clinical features. These clinical features reflect the underlying dysfunctional pathophysiology of liver and spleen.

Scrub typhus was the most common cause of hepatosplenomegaly found by this study. This could be due to high number of referred cases from scrub typhus endemic areas. Dhimal et al. [11] showed that scrub typhus was an important cause of fever of unknown origin in Nepal. The second most common cause of hepatosplenomegaly was found to be hematological origin. Among them, thalassemia major was the most common hematological cause. Similar finding was present in other studies [5,6]. Thalassemia is mainly seen in Tharu communities in Nepal [12].

Enteric fever was the most common cause of hepatomegaly. Multiple studies had shown hepatomegaly as a common manifestation of enteric fever [13-15]. The high number of enteric fever cases

in our study may be attributed to the fact that it was conducted before the Typhoid Conjugate Vaccine was introduced into Nepal's immunization program. Congestive cardiac failure was the second most common cause of hepatomegaly after enteric fever. The other congestive cause was portal hypertension, which is a rare entity in pediatric patient. Often, these patients have a history of umbilical venous catheterization during neonatal period [16].

Hepatomegaly has been described as a major finding in Wilson disease [17,18]. In our study, there was only one case of Wilson disease, a rare autosomal recessive disorder. There were two cases of acute liver failure due to mushroom poisoning. Pediatric acute liver failure is a rare life-threatening illness and mushroom poisoning is occasionally attributable to this deadly illness [19,20]. There was one case of hepatoblastoma, which is the most common primary liver tumor in children and is usually diagnosed during the first 3 years of life [21].

We only encountered three cases of isolated splenomegaly caused by scrub typhus and portal hypertension. It reaffirms that isolated splenomegaly is an unusual condition. Most splenomegaly cases were presented with hepatomegaly as well. Besides these, other causes of isolated splenomegaly are malignancy, congenital cytomegalovirus infection and vascular diseases of spleen [22,23].

Limitation: This is a single hospital-based study and may not be a reflective of a true scenario of a community. The study was conducted in a tertiary care center so referral bias is a possibility.

CONCLUSION

Hepatomegaly and hepatosplenomegaly are relatively frequent in children. These are mostly due to systemic illnesses owing to infection. Splenomegaly usually occurs simultaneously with hepatomegaly however isolated splenomegaly can occur in few cases. Meticulous history, relevant physical examinations and laboratory investigations can steer us towards early diagnosis and timely management of the patient.

Author contributions:

UG and KNS conceptualized and designed the research and reviewed the literature; UG did data collection; UG, HA and SKS analyzed and prepared result. UG and KPT drafted the manuscript; all authors reviewed the manuscript and approved the final version of the manuscript. All authors agreed to be accountable for all aspects of the research work. Note: UG, KNS, HA, KPT, and SKS are abbreviated names of the authors for Uttara Gautam, Kashyap Narsingh Shakya, Harihar Adhikari, Kamal Prasad Thani and Sandip Kumar Sharma, respectively.

Ethics approval: This research was approved by the Institutional Review Committee of Kathmandu Medical College with the reference number of 1109201931 on 11/01/2019.

Consent: Written informed consent was obtained from the parents of all patients. Assent was taken from children about seven years.

Data availability: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of interest: The authors declare that there is no competing interest.

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Layman summary: This study looked at children aged one month to fourteen years who had either enlarged liver, spleen, or both. The majority of children had enlarged liver followed by simultaneous enlargement of both liver and spleen. Both conditions were more common in younger children, especially those under five years old. Fever was the most common symptom seen in these children, and infections were the leading cause. Enteric fever was the most common cause of an enlarged liver, while scrub typhus was the most common cause of simultaneous enlargement of liver and spleen. Cases where only the spleen was enlarged were rare.

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