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## PEDIATRIC ABDOMINAL PAIN; ROLE OF HIGH FREQUENCY ULTRASONOGRAPHY IN ITS EVALUATION

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**ABSTRACT... Objectives:** To assess common presenting features of children with abdominal pain and to determine role of High frequency & Doppler Ultrasound in evaluation of these patients. **Material and Methods:** This is a cross sectional study conducted from August 2012 to December 2012. Data from patients presenting for evaluation of abdominal pain was analyzed for presenting complaints and ultrasound findings according to objectives of the study. **Results:** In total 262 cases were included in the study. The mean age of patients was 6.3 years with a male to female ratio of 1.47:1. Dysuria followed by Diarrhoea and vomiting were most common associated complaints, Urological pathologies were most common ultrasound findings upon evaluation of patients. **Conclusions:** Abdominal pain is a frequent presenting feature in paediatric population, Urological pathologies were most common examination findings. Ultrasound is a useful and safe modality in evaluation of abdominal pain in children.

**Key words:** Abdominal Pain, imaging, ultrasound, Doppler, Urolithiasis, Urology, Pediatrics.

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### INTRODUCTION

Ultrasound remains to be important and frequently used imaging modality in evaluation of Pediatric Acute Abdomen, it has several advantages over other imaging modalities including but not limited to lack of ionizing radiations, which are particularly more dangerous in children. Ability to acquire real time images without the need of sedation (which is usually required in CT Scan & Magnetic Resonance Imaging), also make this modality particularly special for imaging in Pediatric population. Ultrasound also has the advantage of being available as a bedside modality in emergency department<sup>1,2</sup>.

Ultrasound has documented role in evaluation of a number of condition leading to Pediatric abdominal pain including Urological problems (vesico-ureteral reflux, Urolithiasis, Pyelonephritis, cystitis etc.) and other abdominal pathologies like liver disorders, cholelithiasis, intussusception,

appendicitis, pyloric stenosis etc<sup>3</sup>.

Pediatric abdominal pain remains to be a frequent presentation in our region as well however there is scarcity of data available from this region. The main aims of this study were to assess common presenting features of patients with abdominal pain along with most common associated complaints. Secondly it aimed at determining the causes of pain and role of high frequency B Mode scanning in evaluation of Pediatric Abdominal Pain<sup>3</sup>.

### MATERIALS AND METHODS

This study is a record based cross sectional study carried out from August 2012 to December 2012. The site for this study was Department of Radiology, Govt. City Hospital Peshawar, Pakistan. Most of the patients were referred by services of Pediatrics, Pediatric Surgery and General Surgery. A detailed history of presenting complaints was

obtained prior to conducting ultrasound examination. All patients were evaluated by Toshiba Nemio 20® Doppler ultrasound scanner with 4.2MHz frequency transducer later proceeding to 11 MHz frequency. Color Doppler was frequently used in evaluating liver pathologies. Results were recorded in a standardized Microsoft Excel spreadsheet. SPSS (version 17) statistical software was used for data analysis. Statistical analysis was mainly done using prevalence ratios.

## RESULTS

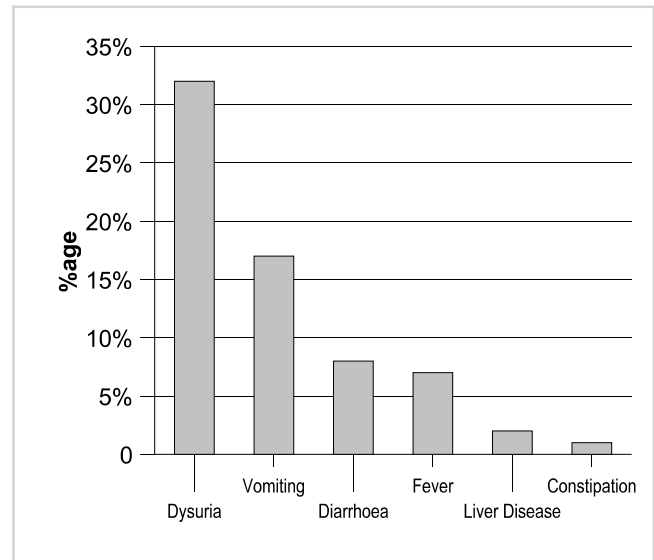
The total number of patients presenting with abdominal pain that were included in this study was 262, Age of patients were in range of 4 days to 15 years, Mean age was 6.3 years. Total number of male patients was 156 and number of female patients was 106 with a male to female ratio of 1.47:1.

Dysuria was the most common associated complaints (32.1%) followed in order by Vomiting (16.8%), Diarrhoea (8.0%), Fever (6.8%), History of Liver Disease (1.5%) and Constipation (1.1%) (Figure: 1).

Ultrasound examination in our subjects revealed a number of pathologies which are mentioned in order as follows; Cystitis (27.9%), Urolithiasis (14.5%), Pyelonephritis (13.7%), Hydronephrosis (11.5%), Liver Parenchymal disease (2.7%), Hepatic Cysts (1.9%), Cholelithiasis (1.9%), Hypertrophic Pyloric stenosis (1.2%), and Hepatoma (0.4%).

## DISCUSSION

Abdominal pain is a fairly common presentation in children presenting to emergency rooms as well as outpatient units. Spectrum of abdominal pain in children is quite vast and may represent a primary pathology of abdomen, pelvis or may be due to generalized pathologies like leukemia, tuberculosis etc. Whatever the cause, acute abdominal pain in children requires prompt investigation and management as delay in diagnosis often lead to serious consequences like peritonitis.



**Fig-1. Common presenting complaints associated with abdominal pain**

Though there has been a major development in field of diagnostic radiology over years yielding in much sensitive and specific modalities like high resolution CT Scans; Ultrasound retains its significance as a frequently employed diagnostic modality in evaluation of Pediatric Acute Abdomen<sup>1,2</sup>.

Majority of cases in our study population suffered from urological complaints. Although classically diseases like glomerulonephritis, Urinary tract infections and Congenital anomalies are described as frequent urological disorders of childhood, the high incidence of Urolithiasis in our population is a matter that needs to be further evaluated. In a previous work by Siddiqui et al. most common presenting feature in pediatric patients with Urolithiasis was Pain (up to 75%)<sup>4-8</sup>.

Hepatobiliary disorders formed the second most frequent cause of abdominal pain. Results of this study were in good comparison with previous work by Siddiqui et al. with Cholelithiasis followed by Liver Parenchymal disease being most common findings. Similar data was reported by Malik et al. demonstrating an increase in incidence of Cholelithiasis among children. Similarly 2.7% of patients suffered from Hepatic cysts. In developing world hydatid liver cysts caused by

Echinococcus Granulosus have a high prevalence and points toward need of Public health intervention in prevention of this disease<sup>9-12</sup>.

A couple of limitations of this study included no records of follow up, and lack of comparison of ultrasound with other imaging modalities.

## CONCLUSIONS

Urological disorders were prime reason of Abdominal pain in our study population. Ultrasound retains its significance as useful, cheap and readily available modality in evaluation of children with abdominal pain.

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A man's worth is  
no greater  
than his  
ambitions.

Marcus Aurelius

