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Sonographic estimation of children right abdominal pain: Expected findings

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The acute abdomen is described as a serious condition that is created by a assortment of diseases and that needs immediate and precise identification. The goal of this recent study was to estimate the exactness of ultrasound in detecting the reasons for the emergency abdomen pain in children. The survey executed on 155 children came with pain in the right side of abdomen by using sonographic methods. The study sample consists of (54.8%) boys and (45.2%) girls. The occurrence was more common among the age group (11-15) which constituted about (51.6%). The huge majority of children demonstrate moderate pain (45.8%). The outcomes of examination show that right kidney diseases have a high ratio (36. 1%).In diagnosing acute abdominal pain ultrasound have 97.2%, 71.4%, 97.2%, and 71.4% for sensitivity, specificity, the value of positive predictive, and the value of negative predictive, respectively. This study deduced that the ultrasound model was a valuable diagnostic method to find out the reasons of the right abdominal pain.

Keywords: Abdominal pain; Children; Sonographic

INTRODUCTION

Human abdomen partition into several areas by the scientist, for diagnosis and treatment to offer the ease of identification and description of internal organs and precise description to simplify the medical process. Division made by using the midsagittal plane and umbilical plane. The area at the right of the median plane and above the transverse plane called the upper quadrant area and includes important organs such as liver, gallbladder, and kidneys (Scanlon and Sanders, 2007; Tortora and Derrickson, 2013; Snell,2011).

The condition, which distinguished by acute and unexpected abdominal pain, progresses over time and needs surgical or medical intervention to treat it, known as acute abdominal pain (Das,2000).

Respiratory infections, acute abdominal pain are the most common causes (respectively) to bring children to the hospital as emergency cases. The extremely significant reason that leads children to the operating room is appendicitis (Anderson and Parry ,1998; Przewratil et al. 2002; Scholer et al. 1996). Acute abdominal pain is a result of different types of diseases (Lameris et al.2009*(* .Ultrasound is a good option for diagnosing abdominal pain (ACEP, 2008; Privette et al. 2011; Ross et al. 2011; Fox et al. 2008; Unlüer et al. 2010).

MATERIALS AND METHODS

A cross-sectional analysis performed at different hospitals in Khartoum state from September 2015 to June 2016. The study sample consists of 155 children 85 boys and 70 girls, their age from 1 to 15 years (mean age 10.2 ± 3.6) attended with abdominal pain.

Data analysis was done by the following table

Ultrasound Findings	Diagnosis		Total
	Disease	Non-Diseased	
Positive	A(true +ve)	B (False +ve)	A+B
Negative	C (false –ve)	D (true –ve)	C+D
Total	A+C	B+D	A+B+C+D

Sensitivity	A/A +C X 100
Specificity	D/B + D X 100

All children who grumble from right side pain involved in this study, who's already diagnosed and injured were excluded. Alpinion E-CUBE 7 Ultrasound Machine with a micro-convex array 5 MHz probe used to gain ultrasound details. Scan all the abdomen and not only the pain site, data were processed using some statistical analysis software (SPSS). Informed permission was gained from the department and Guardians.

RESULTS

The sum of children included in the current study is one hundred and fifty- five; 85 (54.8%) boys and 70 (45.2%)) girls. The most common age group of the study population is 11 to 15 years (table 1). Respecting pain intensity 45.8% of children have moderate pain (table 2). The ultrasound found that out of 155 children complained of abdominal pain 10 (6.5%) was normal and residual cases 145 (93.5%) had various abnormalities; table 3 Figure no 1 and 2 displays the findings of sonography, Rt. Kidney diseases represent high incidence 56 (36.1%) then Gallbladder diseases
37 (23.9%), Liver diseases 27 (17.4%), Intestinal disorders 12 (7.7%), appendicitis 10 (6.5%) and pancreatitis 3 (1.9%) show lowest ratio. The accuracy of the ultrasound expressed in Table 4 showed the following results, 97.2% for sensitivity, 71.4% for specificity, the value of positive predictive was 97.2% while the value of negative predictive was 71.4%.

Table 1: Distribution of patients gender according to age

Age Groups (years)	boy	Girl	Total
0-5	**10**	**7**	**17**
6-10	**40**	**18**	**58**
11-15	**35**	**45**	**80**
Total	**85**	**70**	**155**

Table 2: Distribution of patients according to pain

Pain	Frequency	Percentage
Mild	43	27.7%
Moderate	71	45.8
Severe	41	26.5
Total	155	100

Table 3: Ultrasound findings in patients with acute abdominal pain

Finding	Frequency	percentage
Liver	27	17.4
Gall bladder	37	23.9
Rt. Kidney diseases	56	36.1
Intestinal disorders	12	7.7
Appendicitis	10	6.5
Pancreatitis	3	1.9
Normal	10	6.5
Total	155	100

Table 4: Precision of ultrasound in acute abdominal pain

Ultrasound Findings	Final Diagnosis		Total
	Disease	Non-Diseased	
Positive	137	4	141
Negative	4	10	14
Total	141	14	155

Sensitivity:137/137+ 4 ×100 = 97.2%
Specificity:10/4+10 × 100 =71.4%
Positive Predictive value = 137/137 + 4 × 100 =97.2
Negative predictive value = 10/4 + 10 × 100 =71.4

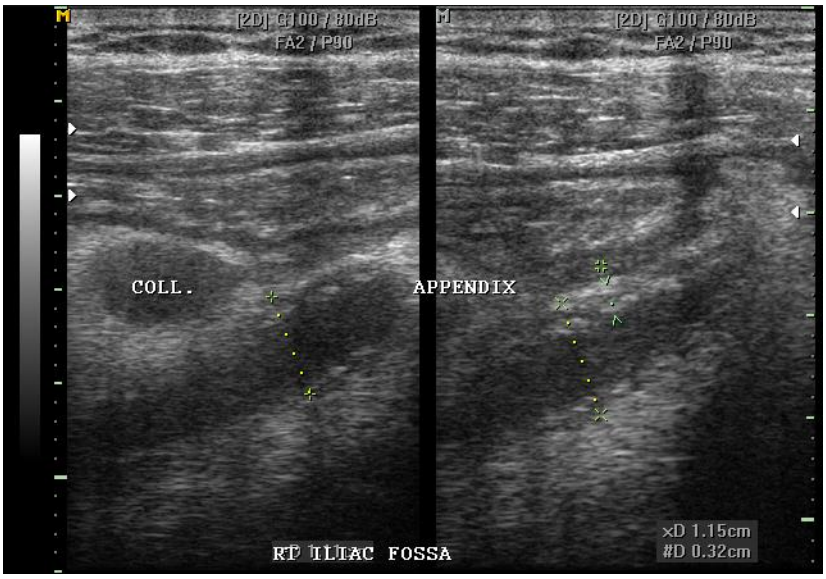

Figure 1: Ultrasound of right iliac fossa showed appendix and fluid collection.

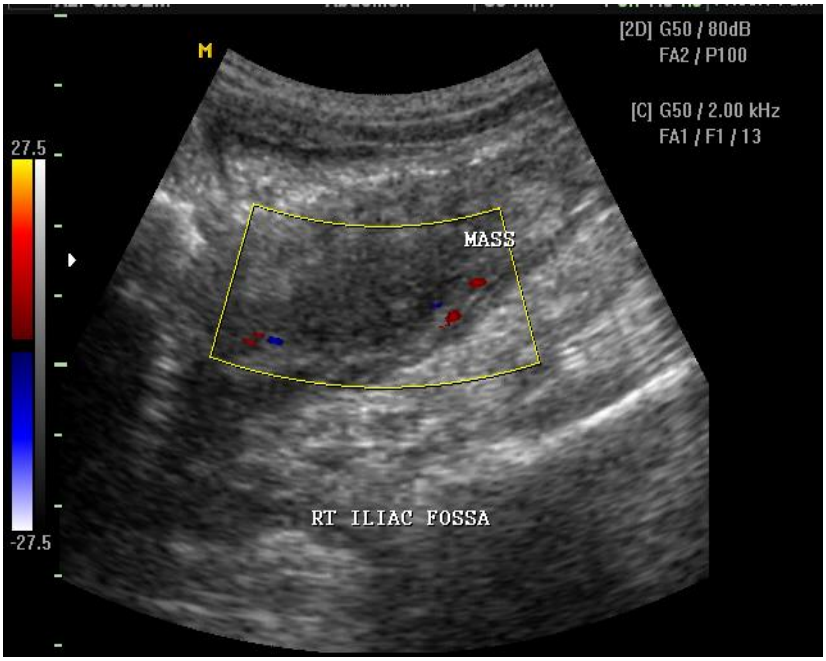

Figure 2 **: Color Doppler of right iliac fossa showed mass.**

DISCUSSION

For healthcare providers, the acute pain in the abdomen is considered a kind of defy.

All over the world, the widespread mainspring to be an inpatient in hospitals and health facilities is abdominal pain.

All age groups can suffer from severe and chronic abdominal pain caused by a variety of illnesses. To obtain appropriate diagnosis different test methods are used (Janes et al. 1988).

This study had been carried out to estimate the exactness of ultrasound in detecting the

giving beneficial details for abdominal organs such as liver, gallbladder, spleen, and kidneys (Aviral et al.2015).

Related to their ages the majority of cases fall in (11-15 years) group. Most patients complain of

moderate pain (48.5%), mild pain (27.7%), and finally severe pain (26.5%).

The survey of children shows that 10 of them were normal and the rest were with various abnormalities such right kidney diseases (36.1%), gall bladder (23.9%), liver (17.4), intestinal disorders (7.7%), appendicitis (6.5%) and pancreatitis (1.9%). This finding was propped up by Gans et al. 2015 who indicate that many reasons behind the occurrence of abdominal pain. And also with Sabina; 2003 who found that most of the detected cases are the same rate of occurrence.

In contradictory to a recent study, Falticeanu et al. 2012 found that the majority of cases admitted as the following biliary tract diseases, small intestine obstructions, infection of the appendix, infection of the pancreas, and kidneys disorders, in sequence. In this study ultrasound showed high values of sensibility 97.2%, specificity 71.4%, PPV 97.2%, and NPV71.4%, this outcome was in agreement with Shirazi et al. (2010) who stated that ultrasonography can 100% detection of appendicitis. Also, Prasad et al. in a survey performed in 2006 indicated that the sensitivity and accuracy of ultrasound were very high. A study by Gupta et al. (2015) supported the previous findings and reported that a high percentage of ultrasound sensitivity and specificity above 90%. Beside, Niedzielski et al. (2010) found that a sonographic scan has the best quality and accuracy to give exact outcomes.

CONCLUSION

As for its excellent qualities in terms of not containing any ionizing radiation and easy to carry and not a high price, ultrasound has become the most appropriate option in diagnosis abdomen pain, also it was functional investigative method in the specification of reasons of right upper quadrant pain and have a great job in the arrangement of cure. Ultrasound can help in decreasing harmful laparotomy average.ultrasonography can evaluate right upper quadrant pain and gives excellent details about the findings in patients.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

BAE designed, wrote the manuscript, data collection, data analysis. BAE also reviewed the manuscript. BAE read and approved the final version.

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