

THE INCIDENCE OF PERFORATED APPENDICITIS AMONG PEDIATRIC PATIENTS IN KHARTOUM NORTH TEACHING HOSPITAL, SUDAN

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ABSTRACT

Introduction: Acute appendicitis is a common emergency condition in paediatrics with different ages. The perforated appendicitis is one of the most serious complications of acute appendicitis which may lead to peritonitis. The aim of our study is to calculate the incidence of perforated appendicitis. **Methods:** This is a retrospective cross-sectional study has been conducted at Khartoum north teaching hospital. The total number of patients was 214. **Results:** the most common age in this study are 13 years old and the mean age is 11 years, 128 of cases were male 59.8% and 86 were females 40.2%. All cases of our study presented with fever 100%, 80.8% presented with right iliac fossa pain, and anorexia 100%. 50.5% of cases came within the first day of presentation and 26.6% of cases came in 4th day of presentation, all cases presented with right iliac fossa tenderness, 15.9% of cases presented with perforated acute appendicitis, 67.29% of cases operated after 6 hours, 5.61% operated in more than 6 hours and 27.1% operated after 6 weeks. **Conclusion:** In this study the incidence of perforated acute appendicitis was 15.9% which is low in comparison with another study because there was no delay in appendectomy operation and the majority of patients came within the first day of the disease.

Keywords: Incidence, Perforated Appendicitis, Paediatrics, Sudan.

Introduction

Acute appendicitis is a common paediatrics surgical emergency, the admissions is about 1-2% of all paediatric surgical conditions (Almaramhy, 2017) . The severity of acute appendicitis was classified as uncomplicated disease or complicated disease (perforated acute appendicitis, appendicular abscess) (Omling et al., 2019) or inflammatory mass (Guidaa et al., 2015). The diagnosis of this condition is challenging because of its symptoms are similar to another diseases such as gastroenteritis in which the patients presented with abdominal pain, vomiting nausea, diarrhea, or fever (Wang et al., 2019) . Or omental infarction(Yang, 2010) which presented with the same symptoms of acute appendicitis. The classic presentation of symptoms are not usual in children (Becker & Bachur, 2007). The children have the higher rate of perforation, rather than the adults. (Jha et al., 2017) The rate of treated perforated appendicitis about 37% among children(Turela et al., 2019). In age of less than 5 years the rate of perforation is 30%. The rate of missed and delayed diagnosis in older paediatrics about 28% to 57% (Çelik et al., 2019). The perforation is define as a fecalith in the abdomen or hole in the appendix (Peter et al., 2008). The delayed of treatment of acute appendicitis will lead to progression of the disease to perforation which can cause complications such as peritonitis, abscess and partial bowel obstruction and this complications increase the rate of morbidity and mortality (Ngim, 2014). The diagnosis of acute appendicitis by: 1-Clinical examination (Groselj-Grenc et al., 2007), 2-Or by using imaging ; in the case of children we request abdominal ultrasound U/S rather than computed tomography CT scan but the uses of it is less due to risk of exposure to ionizing radiation (Phalke & Das, 2018) 3-and other laboratory investigations such C- reactive protein CRP, white cell count and bilirubin (McGowan et al., 2013). The treatment of acute appendicitis are laparoscopic or open appendectomy. However, the role of laparoscopic appendectomy is controversial in management of complicated appendicitis in paediatrics (Tsai et al., 2012) . In new study; uncomplicated acute appendicitis may treated non-operatively and the patients

get the clinical recovery after received of antibiotics (Knaapen et al., 2019). Post-operatively all patients with perforated acute appendicitis must receive intravenous antibiotics for 5 days minimally. (St. Peter et al., 2008).

The aim of this study is to calculate the incidence of perforated appendicitis in Khartoum North Teaching Hospital.

Methods

This is a retrospective cross-sectional study at Khartoum North Teaching Hospital which is the one of reference hospital in Sudan and it placed in Bahri city. We was studied 214 patients who came with acute appendicitis which is one of the most common emergency condition in the paediatric surgery department. Some of the data were collected from the record of patients who were operated and some from new patients came to us then diagnosed as acute appendicitis cases and was operated. Duration of this study from November 2018 to August 2019. When the patients come to our emergency we take the history; assess and analyse the symptoms of acute appendicitis such as periumbilical pain, Right Iliac Fossa pain (RIF), nausea, vomiting, anorexia, fever, dysuria and, changes of bowel habits and previous history of similar abdominal pain; and the duration of all this symptoms.

Then we do the examination; firstly general examination such as temperature, pulse rate... etc. secondly abdominal examination searching for RIF tenderness and rebound tenderness. Then we do the investigations like Complete Blood Count CBC, Urine analysis and sometimes we need to do imaging to support our diagnosis using abdominal ultrasound or computed tomography CT scan. And we followed our patients after the operation until get well then discharged them and must be followed in refer clinic. The data have been collected by questionnaires and was analysed by SPSS application. We was consent all new patients and explained to them all the information will be kept in privacy and consent the hospital for collect the data from records.

Results

The most common age of cases were 13 years old which about 35.5 % and the mean age is 11 years. 59.8% of cases are male and 86 are females 40.2%, 52% of cases came from alhag yousif city. 15.9% of cases presented with perforated acute appendicitis, 18.7% presented with appendiceal abscess, 27.1% presented with appendiceal mass and 38.3% presented simply to moderately inflamed appendix (Table 1). All cases of our study presented with fever 100%, about 78% of cases presented with vomiting, 80.8% presented with right iliac fossa pain, 56.5% presented with periumbilical pain, 35.5% the pain shifted to the right iliac fossa but 64.5% of cases the pain was not shifted, 93.9% of cases have no history of similar abdominal pain. All cases presented with anorexia 100%, 31% of cases presented with diarrhoea, 7.9% came with constipation and 77% of cases

presented with no change in bowel habits (Table 2). All cases presented with RIF's tenderness, 58.9% of cases presented with rebound tenderness and the mean body temperature about 37.4 (17%). 88.8% of cases were received samixone (ceftriaxone) and 6.1% of cases were received samixone and Diclofenac sodium injection. The mean TWBCS in our patients with perforated appendicitis was $18 \times 10^3/\mu\text{L}$ (5.09%), mean platelets values $324.6 \times 10^3/\mu\text{L}$ (91.65%) and mean hemoglobin value 11.5 mg/dl (3.26 %) (Table 3). 50.9% of cases have been diagnosed without imaging, 40.2% of cases have been diagnosed with the US and 8.9% of cases have been diagnosed with CT scan (Table 4). 67.29% of cases operated within the first day of admission, 5.61% operated in the second day of admission and 27.1% operated after 6 weeks which explain the percentage of appendicular mass.

Table 1: Socio-demographic data of the cases and the types of acute appendicitis

Variables	N	%
Age		
9 years	15	7.0
11 years	70	32.7
12 years	53	24.8
13 years	76	35.5
Gender		
Male	128	59.8
female	86	40.2
Types of appendicitis		
Simple to moderate	82	38.3
Appendiceal mass	58	27.1
Appendiceal abscess	40	18.7

Table 2: Symptoms of acute appendicitis

Symptoms	Yes		No	
	N	%	N	%
Anorexia	214	100%	0	0%
Nausea	87	40.7%	127	59.3%
Vomiting	167	78.0%	47	22.0%
Fever	214	100.0%	0	0.0%
Dysuria	0	0.0%	214	100.0%
abdominal pain (RIF)	173	80.8%	41	19.2%
periumbilical pain	121	56.5%	93	43.5%
Shifting	76	35.5%	138	64.5%
History of similar pain	13	6.1%	201	93.9%
No history of similar pain	201	93.9%	13	6.1%
Diarrhoea	31	14.5%	183	85.5%
Constipation	17	7.9%	197	92.1%
No change in bowel habits	166	77.6%	48	22.4%

Table 3: Findings on examination specific to acute appendicitis, Antibiotics was used and investigations

Variables	N	%
Sings		
RIF tenderness	214	100%
Rebound tenderness	126	58.9%
Body temperature (mean)	37.4 C	Std. deviation= 0.42465 (17%)
Antibiotics		
Samixone (Ceftriaxone)	190	88.8%
Diclofenac sodium	11	5.1%
samixone and vortrine	13	6.1%
Investigations		
TWBCs mean	18 x10 ³ /uL	Std. deviation (3.70839)
Haemoglobin mean	11.5 mg/dl	Std. deviation (1.44201)
Platelets	324.6 x10 ³ /uL	Std. deviation (112.60253)

Table 4: Type of Imaging done to patients

Imaging	N	%
No imaging	109	50.9%
Ultrasound scan the US	86	40.2%
A computed tomography CT scan	19	8.9%

Discussion

Appendicitis is an acute inflammatory disease may result from obstruction of the appendix lead to inflammation, perforation and necrosis.(Veli Avci, 2019).It is a one of the commonest surgical emergency in adults or paediatrics.(Aneirosa et al. , 2019). We were conducted this study in Khartoum North Teaching Hospital which is a one of the reference hospital in Sudan which located in Bahri city and contain one of the referral centre of the paediatric surgery in the Sudan. Highest incidence in of acute appendicitis in our study were in males rather than females but both at the similar age 11-13 years old and the mean age 11 years (Becker & Bachur, 2007). The symptoms of acute appendicitis in our study were RIF pain which was less in percentage than previous studies 94%(Ngim, 2014) because of some cases were came to us before shifted of the pain to RIF, the percentage of vomiting, absence of changed in bowel habits, tenderness and rebound tenderness in RIF near to percentage in previous studies (Ngim, 2014; Becker & Bachur, 2007). 50.5% of cases were came within the first day to our paediatric surgery emergency. The diagnosis of cases in our department depend on clinical examination so 50.9% diagnosed without imaging just 40.2% diagnosed by US. Another investigations that we were did; Complete

Blood Count CBC and found that TWBCs was high and the mean value was 37.4 (17%) which similar to another studies (McGowan et al., 2013) (Groselj-Grenc et al., 2007) (Yang et al., 2010). In our study 88.8% of patients received antibiotic (ceftriaxone) before and after the operation. In recent study 15.9% of cases presented with perforated acute appendicitis and it's low in compare with other study which the rate of perforation about 52% (Ngim et al., 2014) because we operate all patients whom diagnosed with acute appendicitis without delay in time of operation and almost cases operated within the first day of admission (Papandria et al., 2013)

Conclusion

The incidence of perforated acute appendicitis was 15.9% which is low in our study in comparison with the previous study because there was no delayed in appendectomy operation in our department and the majority of patients come within the first day of the disease. That means the delayed operation increases the risk of perforated appendicitis.

Conflict of interest

No one of authors has a conflict of interest.

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