Anti-Inflammatory factor (IL-10) Per and Post-open Appendectomy (oA) in

Iraqi children under 14 years

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Abstract

Background: Even though it is uncommon, acute appendicitis can occur at any age, making it one of the most difficult diagnoses in very young children. As a result, appendectomy has been performed on young children over the world for acute appendicitis. patients and methods: About 65 children's patients who were surgically diagnosed with perforated acute appendicitis and were admitted to the Abn Al-Baladi hospital in Baghdad city between January and May 2022 were included in this study. 46 males and 19 girls (3 -14 years old) with a clinical diagnosis of AA necessitating open surgery were eligible for prospective evaluation within the current study. Each patient had 2 ml of venous blood taken from them both pre- and post-operation. Detection levels of IL-10 by using double-antibody sandwich ELISA. Results: The age groups with the highest rates of acute appendicitis were those between the ages of (11 -15) years, and those between (6 – 10) years, Males outnumbered females 46.71 % to 19.29 %, as well as the most common presenting symptom, was abdominal pain (90.8%), Nausea and vomiting (85%), and Non-specific symptoms such as diarrhea and Anorexia as (40, 32.3)% respectively, also significant statistical difference (157.1 41.2 vs. 181.1 49.2) was observed between the two groups (pre and post - operation) (P>0.05). Conclusion: The age groups with the highest rates of acute appendicitis were those between the ages of (6 – 15) years, Males with acute appendicitis more than females, as well as the most common presenting symptom was abdominal pain, Nausea, and vomiting, so the current study showed IL-10 was significantly different in the two groups (per and post- open appendectomy (OA) (P>0.05).

Keywords: Interleukin-6 (IL-6); open appendectomy (OA); Iraqi children; under 14 years

1. Introduction

Since the late 1940s, the prevalence of acute appendicitis (A.A.) has been progressively reducing. In affluent nations, the prevalence of AA ranges from 5.7 to 50 patients per 100,000 people each year, peaking between the ages of (10 and 30) years (1).

The underlying pathophysiology of appendiceal luminal blockage brought on by reactive lymphoid tissue hyperplasia, fecaliths, foreign materials, or parasites constitutes the complex etiology of AA. Diet, seasonal circumstances, and family history may all have an impact on how AA develops (2). In youngsters, a precise before-operation diagnosis is still challenging [Hennelly]. To lower the risk of perforation, mortality, and length of hospital stay, early identification and surgical management are crucial (3&4)., Consequently, the healthcare budget is heavily burdened (5).

The open technique to appendectomy was first described by McBurney (6). Due to its good efficacy and safety, it has since remained the conventional treatment of choice for acute appendicitis, largely remaining unchanged for 100 years. Following the first report by Semm in 1983, appendectomy has increasingly been performed using a minimally invasive technique since the development of laparoscopy (7).

The most frequent surgical procedure in the emergency department is an appendectomy, which accounts for 1% to 2% of all surgical procedures (8). Since the clinical examination performed by the surgeon is still the most crucial in determining whether a child has AA, measuring the serum cytokine levels after surgery may help to monitor their progress and watch for complications. IL-10 was the possible biomarker to help achieve the diagnosis of AA in children, according to Eriksson et al., (9). credible estimation of problems might be based on monitoring of leukocytes, interleukins (IL), and C-reactive protein (10).

The complicated relationship between immune cells and inflammation in AA is mediated by a multitude of cytokines. According to their role in the immune response, cytokines a vast collection of proteins, peptides, or glycoproteins can be categorized as pro- or anti-inflammatory. They are mostly secreted by macrophage cells and Tlymphocytes (1112).

The effects of pro-inflammatory cytokines can be transmitted to a systemic level, increasing the risk of an inflammatory reaction in previously intact organs and tissues (1314). Conversely, locally created pro-inflammatory cytokines can induce suppression of systemic inflammation and prevent inflammation in other tissues (15&16).

2. Patients and Methods

About 65 children's patients who were surgically diagnosed with perforated acute appendicitis and were admitted to the Abn Al-Baladi hospital in

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Baghdad city between January and May 2022 were included in this study. 46 males and 19 girls (3 -14 years old) with a clinical diagnosis of AA necessitating open surgery were eligible for prospective evaluation within the current study. All patients were well-informed and signed written consents.

For every patient enrolled in this trial, informed consent was obtained from a parent or legal guardian. Each patient had 2 ml of venous blood taken from them both pre- and post-operation. For 10 minutes, the samples were centrifuged at 5000 rpm. Before usage, serum was collected and kept at -20°C. Enzyme-Linked Immunosorbent Assay (ELISA): ELISA with a double antibody sandwich was utilized to measure IL-10 levels in the serum (Biotech Co., Ltd., China).

We followed the manufacturer's directions for every procedure.

3. Statistical Analysis

Data analysis was carried out using SPSS 17.0 software. M S.D., or mean standard deviation, was used to display the data. T-test was used to compare pre and post - operation, and significance was recognized at P0.05.

4. Results

The age groups with the highest rates of acute appendicitis were those between the ages of (11 -15) years, and those between (6 – 10) years, according to (Table 1 and fig.-1).

Males outnumbered females 46.71 % to 19.29 %, as shown in the distribution (Table 1 and fig. 2).

Table (1): Distribution of children with acute appendicitis according to age and gender		
Age (years)	No.	%
<5	2	3
6-10	24	37
11-15	39	60
Gender		
Male	46	71
Female	19	29
Total	65	100

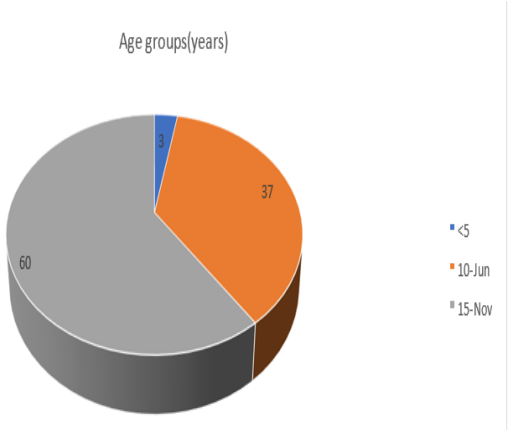

Figure (1): Distribution of children with acute appendicitis according to age groups

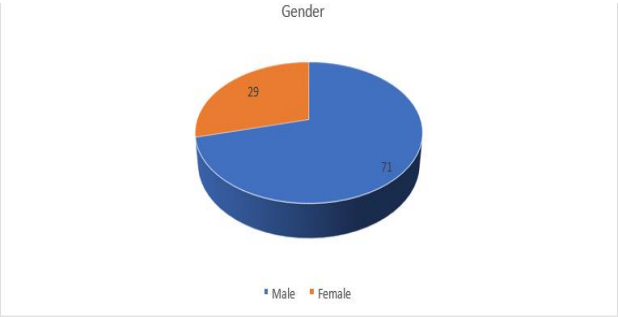

Figure (2): Distribution of children with acute appendicitis according to gender

Table (2): clinical Symptoms and Signs of patients with Appendicitis		
Symptoms		%
Abdominal pain	90.8	
Nausea and vomiting	85	
Fever	60	
Diarrhea	40	
Anorexia	32.3	
Irritability	15	
Cough/sore throat	15.3	
Lethargy and somnolence	9	
Dysuria	6	
Earache	1.5	

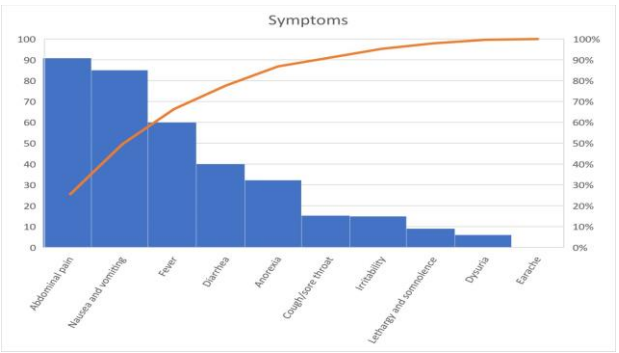

Figure (3): Clinical Symptoms and Signs of patients with Appendicitis

The most common presenting symptom was abdominal pain (90.8%), Nausea and vomiting (85%), and Non-specific symptoms such as diarrhea and Anorexia as (40,
32.3) % respectively (Table -2 and fig. 3).

Table (3): Dynamics of serum level of IL-10 pre and post - operation			
serum level of IL-10(pg/ml)	Before operative	-after-operative	p-value
(M ± S.D).	157.1 ± 41.2	181.1 ± 49.2	P>0.05

Significant statistical difference (157.1 41.2 vs. 181.1 49.2) was observed between the two groups (pre and post - operation) (P>0.05). (Table 3-2 and Fig. 4-).

5. Discussion

One of the most frequent intra-abdominal disorders, appendicitis can be treated with a very straightforward operation. Although appendicitis-related death rates have decreased significantly over the past century, complications are still frequent in all range of age (17).

In this study, The age groups with the highest rates

of acute appendicitis were those between the ages of (11 -15) years, and between (6 – 10) years, as well as males outnumbered females 46.71 % to 19.29 %, this completely conformed with the results of Ahmed,2011, who showed Males are affected 1.5 times more frequently than females (1) (18). , a definitive diagnosis could be made in 70–80% of patients(19) , roughly 32% of appendectomies revealed normal appendices following the surgeries. So according to Addiss,1990 findings, 12 percent of males and 23 percent of females have emergency appendicectomies during their lifetimes, despite the fact that the true lifetime risk of appendicitis is only 9 % and 7 % for males and females, respectively (20).

A better focus on many etiologically recommended factors, such as breastfeeding (21), hygiene, food (22), infection (23), seasonal variation (24), and genetics (25), has been primarily credited for the declining incidence rates of acute appendicitis.

The most common presenting symptom was abdominal pain (90.8%), Nausea and vomiting (85%), and Non-specific symptoms such as diarrhea and Anorexia as (40, 32.3) % respectively (Table -2 and fig. 3).

In a previous study, the most prevalent symptoms were abdominal pain (90.7%) and vomiting (83.9%), Based on these results, it is possible to diagnose appendicitis early even in very young children history and physical examinations are the keys to early diagnosis of appendicitis (26 &27).

The delay in the diagnosis of acute appendicitis has been attributed to nonspecific presentations, the overlap of symptoms with many other common childhood illnesses, together with the inability child to express, and the difficult abdominal examination misdiagnosis group. Misdiagnosis rate ranges from 28 to 57% in 2 – 12-year-old children and approaches to nearly 100% in children younger than 2 years (28).

The current study showed the IL-10 was significantly different in the two groups

(Per and post operation) open appendectomy (P>0.05). Activated macrophages and Th2-cells are the main producers of the anti-inflammatory cytokine interleukin 10 (IL10) (29). Its function is to lower the ability of cells to deliver antigens and to block the Th1 immune response. The Th2 response is simultaneously potentiated by IL-10, which increases B-cell proliferation and antibody production (30).

6. Conclusion

The age groups with the highest rates of acute appendicitis were those between the ages of (6 – 15) years, Males with acute appendicitis more than females, as well as the most common presenting symptom was abdominal pain, Nausea, and vomiting also Non-specific symptoms such as diarrhea and Anorexia, so current study showed IL-10 was significantly different in the two groups (per and post- open appendectomy (OA)) (P>0.05).

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None

Conflict of Interest

None

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