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US ACCURATE IN DIAGNOSIS OF APPENDICITIS

[1]Abdullah Mater Albaqami, [2]Amal saad albanyan, [3]Feras Mzahem A Alsheri, [4]Alwaleed Talal Alotaibi, [5]Saeed Saleh S Barakat, [6]Abdulrahman falah Alotaibi, [7]Abdulhadi alshammri, [8]Menwer farhan alanazi, [9]Bader Hmood Alotaibi, [10]Bader Majed L Alotaibi, [11]Saleh a alshehri

[1]Senior Specialist – Radiological, Al-Muzahmiyah General Hospital
[2]Cardiovascular technologist, King Abdullah bin abdulaziz university hospital
[3]Radiology Technician, KING Abdullah University
[4]Echocardiography Technologist, King Fahad Medical City
[5]King Abdullah University Hospital, Radiology Technologist
[6]King abdullah university hospital, Cardiac technology-echocardiography
[7]Prince mohamed bin abdulaziz hospital, Cardiac technologist
[8]Echordiogram tech, King fahad medical city
[9]Prince Salman bin Mohammed Hospital, Specialist - Radiological Technology
[10]King Khalid hospital, Senior specialist radiological- technology
[11]Hurymala general hospital, Senior specialist radiological - technology

Abstract:
The objective of this report is to find out the accuracy of Ultrasound (US) in diagnosing the appendicitis. We conducted systematic review of databases Medline, Embase and Cochrane to find out the answer to research question. The articles were selected based on inclusion and exclusion criteria, and finally 17 studies were collected.
Sensitivity and Specificity for diagnostic accuracy of US was 69% and 81% respectively. It does not involve radiations. Most US examinations are indeterminate for diagnosing appendicitis. And for evaluating the appendicitis CT is considered as preferred line of imaging test. The patients having appendicitis may not get benefitted from US diagnosis alone and may be recommended for more specific methods of diagnosis.

Corresponding author:
Abdullah Mater Albaqami,
Senior Specialist,
Radiological, Al-Muzahmiyah General Hospital

QR code

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INTRODUCTION:

Diagnosis of Appendicitis is highly challenging. In 34% of the cases, when appendicitis is misdiagnosed, the patient not having disease is either subjected to unnecessary surgery or appendectomy is delayed in cases of appendicitis. The decision about operating, follow up or observing the patient remains unclear. Diagnostic Accuracy of US for appendicitis showed sensitivity of 35.5% and specificity of 71.2% which represents low diagnostic accuracy (Mostbeck et al., 2020).

The study aims to determine the extent of accuracy of Ultrasound (US) in diagnosis of Appendicitis.

The study is based on peer reviewed journals retrieved from last five years i.e., from 2018 to 2023.

MATERIALS AND METHODS:

Systematic search of databases Medline, Cochrane, and Embase for the last seven years i.e., from 2016 to 2023 was done. Based on inclusion and exclusion criteria the collected studies were screened and evaluated by two independent authors. After PICOT analysis 17 studies were included in the final review.

RESULTS:

US being a non-ionizing method, does not involve radiation. Sensitivity and Specificity for diagnostic accuracy of US was 69% and 81% respectively. The accuracy of US is relative to that of physical examination and the patient diagnosis may not be solely rely on the US outcomes. It requires more specific diagnostic tests to further confirm the disease. For a very high number of appendicitis patients the US examination results were indeterminant.

DISCUSSION:

In cases where diagnosis is based on US alone, the post-test probability of having appendicitis in patient is 92% and 8% of the patients will have to go for appendectomy not required (Giljaca et al., 2016). After negative result of US, the post-test probability for having appendicitis was 55%. It means the US diagnosed there is no appendicitis in a patient but the patient had appendicitis. Such incorrectly diagnosed patients may be discharged without any follow up and may face worst outcomes. In a study by Crocker et al (2020), the diagnostic accuracy of US was only 13.7% and negative cases recommended for appendectomy was 17.7% for US. A study by Cho & Oh(2023) based on literature review of the collected studies from databases showed 93% accuracy of bedside Point of Care US. However, this study was done included very small number of articles and was very small in its scope of practice.

US is used as first modality for imaging and diagnosing the appendicitis (Mostbeck, Adam & Owens, 2016). US is cost effective and reduces ionizing radiations. Even though US has low diagnostic accuracy, it is used as preferred method in diagnosis if US because it does not use radiation. The appendix if remains non visualized and the confirmation is unclear during the initial US, clinical reassessment with complementary CT or MRI may be done.

Diagnostic accuracy of US is found to be varying in different studies conducted in different years. It may be due to the constraints of time and settings in different care units.

Limitations: The diagnostic accuracy of Us is not compared with other methods or clinical standards of measuring US.

Recommendations: The patients having appendicitis may not get benefitted from US diagnosis alone and may be recommended for more specific methods of diagnosis. Diagnosis of US can be improved in appendicitis using standard structural reporting approach. Rather than using standard binary reporting system (Yes or No), it is advisable to use 5 category interpretable scheme (1-3: Positive, intermediate, negative, when appendicitis is present and 4-5 when secondary signs identified or not).

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