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Study of Abdominal findings by ultrasound in COVID - 19 patients at King Fahd Specialist hospital Tabuk, Kingdom of Saudi Arabia

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This was a study to evaluate abdominal pathology by the use of ultrasound that was done at King Fahd Specialist Hospital - Tabuk - Kingdom of Saudi Arabia from January 1, 2022 to May 2022. The problem of the study was to know the negative impact of the COVID-19 virus on the digestive system, especially the abdomen, and its problems, which became clear and its importance in reducing risks. The intended aim of this study was to demonstrate the role of ultrasound in diagnosing abdominal outcomes in a COVID-19 patient. The data collected by the Designed clinical data collection sheets containing all study variables of 41 patients came to the ultrasound department to perform an abdominal ultrasound in the study area. The data was analyzed using Excel to give a more accurate analysis of the data. According to the results of the clinical data collection sheet, ultrasound has an effective role in assessment of the negative impact of COVID-19 virus on the digestive system and abdomen with great confidence, Overall, the researchers recommended that ultrasound imaging it is better to detect the circumference of the abdomen, especially liver and gallbladder diseases and digestive problems, which are more accurately and accurately shown in ultrasound..

Keywords: Assess the negative impact of COVID-19 pandemic on digestive system and abdomen, Ultrasound, The circumference of the abdomen and digestive system.

INTRODUCTION

The COVID19 pandemic, with many millions of confirmed cases and hundreds of thousands of deaths in 185 countries around the world (The Lance 2020), is a medical emergency we have never faced. The pandemic outbreak has led to an overwhelming number of severe cases, which has compromised the delivery of health services, with difficulties in guaranteeing diagnostic tests, imaging, ventilators, health personnel, and personal protection equipment (J EducEval Health Prof 2020).

Information regarding coronavirus disease 2019 (COVID-19) is constantly evolving and clinical presentations along with fever and respiratory symptoms are increasingly recognized. SARS-CoV-2 coronavirus, severe acute respiratory syndrome, is believed to be the virus that causes COVID-19, originating in Wuhan, China in December 2019, and is now the cause of an ongoing and historic pandemic. SARS-CoV-2 gains entry into human cells via the angiotensin-converting enzyme 2 (ACE2) receptor, which is predominantly found in type II lung cells. However, ACE2 is widely expressed in the viscera of the human body (Vaduganathan et al. 2020). This may result in a wide range of direct targets for the virus, including the intestine, blood vessels, liver, kidney, heart, and brain, suggesting a broad organic orientation. It is therefore not surprising that a large subgroup of patients may initially present with and/or develop atypical clinical presentations that can be seen on imaging and influence the course of the disease (Luo S,et al.2020).

In the setting of COVID-19, the risk of contamination and infection is extremely high, so the most important thing is to protect the operator, assistant staff, and patients. Consider having a dedicated ultrasound machine just for COVID-19 patients so as not to transmit the disease to staff or other patients. Our suggestion is to disinfect first the probe(s), cables, and machine with wipes, then apply the first cover to the probe(s) and secure with elastic bands, then also cover the ultrasound machine. Before entering the room and/or scan patients, put a second cover. In this way, you (Sonographer) change from patient to patient the external cover and disinfect the internal one, in order also to protect the probe

from chemical damage. Always wear appropriate personal protective equipment (mask, face shield, gown, double gloves etc). Abdomen ultrasound is possible to use a convex array Convex probe allows better resolution of abdominal pathology(Huh S,2020).

Recent studies have demonstrated abdominal imaging findings that help to understand the diverse imaging features that can be seen with diffuse or atypical infection (BhayanaR,et al.2020). Thus radiologists should be aware of potential abdominal imaging findings in patients with COVID-19.

The present study aimed to review and describe retrospectively the findings of abdominal ultrasound in a series of patients with COVID-19 who were recently treated at King Fahd Specialist Hospital, Tabuk.KSA.

MATERIALS AND METHODS

Descriptive cross-sectional hospital -based study design was conducted from January 2022 to May 2022 at Tabuk city - Kingdom of Saudi Arabia at King Fahd Specialist Hospital. All patients of all ages and genders who attended to the ultrasound department for abdominal ultrasound examination and who had previously been infected with COVID-19 were included in the study. Patients who came for abdominal ultrasound examination but had no previous infection with COVID-19 were omitted from the study. Study was accepted by Al-Ghad International Collage Research and Ethics Committee and informed consent from the patients was obtained. Reliable tools have collected data that are essential for evaluating the role of ultrasound in diagnosis abdominal findings in COVID-19patient.

The data were gathered through clinical data collection sheets developed by the researchers, which contained demographic characteristics of participants, closed, and open questions. The data were analyzed using statistical package for social sciences (SPSS) program and the results were displayed in frequency and percentage.

RESULTS

The results in table and figure (1) demonstrated the numbers of patients who attended the hospital for an abdominal ultrasound examination, where the percentage of male patient 56.10%, while the percentage of female patient was 43.90%.

Table1: Diagnostic frequency distribution according to patients' sex, n (41).

Patients' gender	Frequency	Percent
Male	23	56.10%
Female	18	43.90%
Total	41	100%

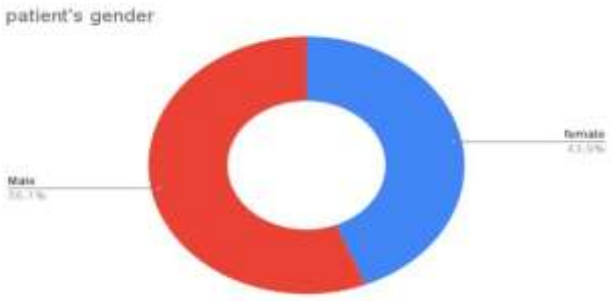

Figure1: Diagnostic frequency distribution according to patients' sex, n (41).

The results in table and figure (2) represents the age of the patients distributions, where the percentage of participating patients who were older than 25 years was 34.10% , while the lowest percentage was 7.30% for the patient age more than 60 years.

Table 2: Diagnostic frequency distribution according to patients' ages, n (41).

Patients ages	Frequency	Percent
More than 25 years	16	34.10%
More than 30 years	6	14.60%
More than 40 years	6	14.60%
More than 50 years	7	17.20%
More than 60 years	3	7.30%
More than 75 years	5	12.20%

Figure2: Diagnostic frequency distribution according to patients' ages, n (41).

The results in table and figure 3 represents the age of the patients distributions, where the percentage of participating patients who were older than 25 years was 34.10% , while the lowest percentage was 7.30% for the patient age more than 60 years

Table3: Diagnostic frequency distribution according to patient outcomes, n (41).

Diagnostic Result	Frequency	Percent
Normal	16	39.00%
Abnormal	25	61.00%
Total	41	100.00%

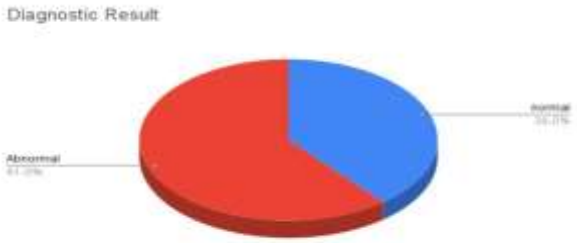

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Figure3: Diagnostic frequency distribution according to patient outcomes, n (41).

According to the results seen in table and figure (4) , the majority of patients was suffering from liver and spleen enlargement with percentage (29.30% , 24.40%) respectively, While the percentage of patients who did not suffer from any abdominal problem after recovering from COVID-19 (19.50%).

Table4: Diagnostic frequency distribution according to ultrasound finding after infection with COVID-19, n (41).

Ultrasound finding	Frequency	Percent
No symptoms	8	19.50%
Liver enlargement	12	29.30%
Enlarged spleen	10	24.40%
Intestinal hernia	3	7.30%
Kidney stones	3	7.30%
Cholecystitis	3	7.30%
Gallstones	2	4.90%
Total	41	100.00%

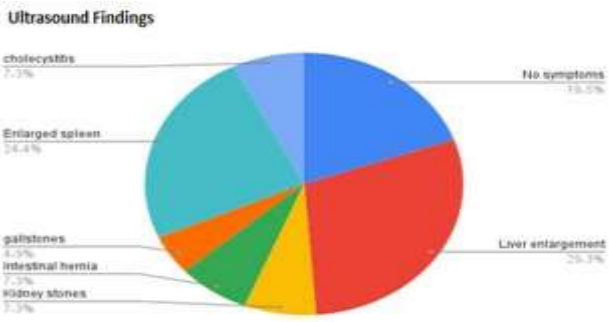

Figure 4: Diagnostic frequency distribution according to ultrasound finding after infection with COVID-19, n (41).

DISCUSSION

According to result in table and figure (1), the study showed that (56.10%), of participating patients was male while the percentage of female patients was (43.90%). This result agrees with Mr. Mohsen Ahmed studies, 2020 (Egypt J RadiolNucl Med) , A total of 30 patients, 26 were males (86.66%), and 4 were females (13.3%), the average age of the patients was 57.7 years old. The data in table and figure (2), showed that the percentage of participating patients who were older than 25 years (14) with a percentage of (34.10%), while the percentage of participating patients who were older than 30 years (6) with a percentage (14.905), and the percentage of participating patients who were 40 years old (6)) by a percentage (14.60 %), and the percentage of participants for those over 50 years old was (17.20%), and the percentage of participants for those who were over 60 years old was (7.30%), while the percentage of participating patients whose age was above 75 years (12.20%) . So, the highest participation rate was for patients over 25 years of age.

In a total number of patients (41) (table and figure (3), the study showed that, the patients abdominal examinations after infection with the COVID- 19 were more abnormal compared to the normal result. Where it was abnormal in 61% of patients, while it was normal in 39% of patients.

According to ultrasound examination findings after infection with COVID-19 (table and figure (4), the percentage of patients suffering from an enlarged spleen and liver was (29.30% ,24.40%) respectively, in 2022 by Mr. Mohsen Ahmed (Egypt J RadiolNucl Med) study concluded that , the most common sonographic observation was hepatomegaly (*n*, 23/41, 56%) and biliary system disease (n, 17/41, 41.4%); the imaging findings were correlated with the clinical and laboratory data .

About (7.30%) of patients were diagnosed with a kidney stone and hernia in the intestine, and the percentage of those who had gallstones was (4.90%), while a total of (8) patients did not suffer from any abdominal problem after infection with COVID- 19 with a percentage (19.50%)

Therefore, the results of the study prove to us that 61% of patients, after infection with the Corona virus, were affected by symptoms in the abdominal area, and the results also prove to us the ability of ultrasound to determine the accuracy of obtaining results of diseases affecting the abdominal area compared to other types of radiation.

CONCLUSION

This study has been conducted to evaluate the role of ultrasound in diagnosis abdominal in COVID-19 patient. The study shows that ultrasound and computed tomography are an effective method that can confirm clinical disorders and laboratory tests for diseases of the abdominal area and digestive system using statistical data analysis using the Excel program.

The age group most affected by abdominal diseases is (25-50) years. The sex most affected by abdominal diseases was males (23) more than feminine. The most common abdominal disease among patients was an enlarged liver and spleen. There was a significant association between clinical symptoms and normal and

abnormal outcomes.

CONFLICT OF INTEREST

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

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AUTHOR CONTRIBUTIONS

Gihan Abdelhalim A Ahmed designed and revised the final manuscript; Raghad Al-shehri contributed to questionnaire design; WaadAlshan and HananAssaf analyzed and interpreted the results; Nisreen Haj wrote the discussion and conclusion; Zahra Asiri,AlaaIbrahimm contributed to literature search and reviewed the result and discussion. All authors read and approved the final version and did the same efforts equally.

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