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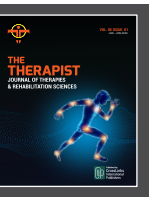

Original Article

Evaluation of the Causes of Abdominal Right Upper Quadrant Pain using Ultrasound

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ABSTRACT

The outermost upper quadrant at the right side of the abdomen is right upper quadrant, also acknowledged as epigastrium. **Objectives:** To evaluate of the causes of abdominal right upper quadrant pain using ultrasound. **Methods:** This was a descriptive cross-sectional study conducted at private medical setup of Gujranwala, Pakistan from January 2022 to March 2022. The information required for this study was collected by using ultrasound equipment TOSHIBA XARIO 100 having probe frequency of 3.5Hz. A sample size of 70 patients was considered having abdominal pain in the right upper quadrant. The data were entered and analyzed using SPSS version 20.0. **Results:** Highest frequency of RUQ pain was shown in more than 45 years in females 47 (67.1%). The most common diagnosis of patients with RUQ pain was fatty liver disease 27 (38.6%) followed by Cholelithiasis 11(15.7%). **Conclusions:** Ultrasound is the gold standard modality for diagnosing abdominal organs diseases as it is a cheap, non-invasive and fast modality. Most common diseases diagnosing in patients with RUQ pain is fatty liver (38.6%) in old females (67.1%).

INTRODUCTION

The outermost upper quadrant at the right side of the abdomen is Right Upper Quadrant, also acknowledged as Epigastrium [1-3]. Right Upper Quadrant abbreviated as RUQ outstretched from umbilical plane at the right side to right ribcage [4]. Right upper quadrant (RUQ) accommodate organs that are liver, gall bladder, biliary track, head of pancreas, and right kidney. Epigastric or RUQ pain is most common presenting problem in hospital settings [5]. In patients with right upper quadrant (RUQ) pain, imaging plays a vital role in diagnosis [6]. The first line choice of modality for the assessment of pain is ultrasound. To locate the cause of pain and early diagnosis is essential for proper treatment [7,8]. The differential diagnosis for pain in RUQ includes hepatic diseases, acute hepatitis, fatty liver disease, G.B stones, Cholecystitis, pancreatitis, renal disorders, right Hydronephrosis, and renal parenchymal lesions [9-11]. Pathologies involving liver include hepatitis, a condition of inflammation of liver, categorized as acute or chronic [10,12]. Fatty liver disease is a condition involving deposition of extra fat in the liver. Hepatitis involves inflammation of liver [13]. Pathologies of gall bladder involves stones that are hard deposits and clog the cystic duct [14]. A cute cholecystitis involves abrupt inflammation of gall bladder. Pancreatitis, a condition having inflammation of pancreas [15]. Hydronephrosis is a condition in which urine is unable to drain from kidneys

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causing dilatation or swelling of calices or renal pelvis [16,17]. Renal stones, also called Urolithiasis are hard structures and are made up of salt and minerals [18,19]. Fluid filled sacs in the kidneys are called renal cysts. These cysts can be simple and complex [20,21]. Ultrasound in the front-line imaging modality used in modern medicine due to its vast availability. It provides quick, real-time and dynamic imaging techniques [22,23]. It is non-invasive, painless imaging modality that uses non-ionizing radiations which causes no harmful effects on the human body. Ultrasound can be escorted to the patient's bedside and it provides expeditious information [24,25]. This study showed the assessment of patients presenting with pain in right upper quadrant. The best modality for diagnosing pain in RUQ is ultrasound. Ultrasound is widely used due to its advantages as it is cheap, fast, and non-invasive. It contains no harms so it can be performed at any age.

METHODS

This was a descriptive cross-sectional study conducted at private medical setup of Gujranwala, Pakistan from January 2022 to March 2022. The information required for this study was collected by using ultrasound equipment TOSHIBA XARIO 100 having probe frequency of 3.5Hz. This study included patients who presents with RUQ pain while pregnant females are excluded. A sample size of 70 patients has considered from a previous published article. The data were entered and analyzed using SPSS version 20.0.

RESULTS

Age Groups	Frequency(%)
0-15	4(5.7%)
16-30	17(24.3%)
31-45	24(34.3%)
More than 45	25(35.7%)
Total	70(100.0%)

Table 1: Age Group of Respondents

This is a descriptive cross-sectional study conducted at private medical setup of Gujranwala, Pakistan. The study was organized over a period of three months from January 2022 to March 2022. Table 1 shows age group of respondents categorized as 0-15years 4(5.7%), 16-30 years 17(24.3%), 31-45 24(34.3%) and more than 45 were 25(35.7%). It demonstrates that the highest frequency of right upper quadrant pain is shown in age group of more than 45 years while least frequency is between 0-15 years.

Gender	Frequency (%)
Female	47(67.1%)
Male	23(32.9%)
Total	70(100.0%)

Table 2: Gender of Respondents

Table 2 shows gender of respondents which demonstrate that females 47(67.1%) are more common to develop right upper quadrant pain then males 23(32.9%).

Pain Duration	Frequency(%)
Less than 1 month	41(58.6%)
Less than 6 months	18(25.7%)
Less than 12 months	11(15.7%)
Total	70(100.0%)

Table 3: Pain Duration of Respondents

Table 3 shows pain duration of respondents which demonstrates that pain in RUQ is more common in duration of less than 1 month 41(58.6%) following by less than 12months 11(15.7%).

Ultrasound Findings	Frequency(%)
Hepatitis	2(2.9%)
Fatty Liver	27(38.6%)
Cholelithiasis	11(15.7%)
Cholecystitis	2(2.9%)
Right Renal Stone	11(15.7%)
Right Renal Cyst	1(1.4%)
Right Renal Hydronephrosis	7(10.0%)
Pancreatitis	3(4.3%)
Normal USG Findings	6(8.6%)
Total	70(100.0%)

Table 4: Ultrasound findings of Respondents

Table 4 shows the ultrasound findings of patients' presenting with RUQ pain. The most common diagnosis of patients with RUQ pain was fatty liver disease 27(38.6%), followed by hepatitis 2(2.9%), Cholelithiasis 11(15.7%), cholecystitis 2(2.9%), right renal stone 11(15.7%), right renal cyst 1(1.4%), right renal Hydronephrosis 7(10.0%), pancreatitis 3(4.3%), normal USG findings 6(8.6%).

DISCUSSION

It was a descriptive cross-sectional analysis conducted at private medical setup of Gujranwala, Pakistan. Information required for this study was collected from TOSHIBA XARIO 100 with use of probe having frequency of 3.5Hz. This study included patients who presented with RUQ pain while pregnant females are excluded. The outermost upper quadrant at the right side of the abdomen is Right Upper Quadrant, also acknowledged as Epigastrium. The current study evaluates the causes of pain in right upper quadrant (RUQ) which concluded that the highest frequency of age was in more than 45years 25(35.7%) in females. Fatty liver was one of the most dominant diseases in patient's presenting with RUQ pain. A study carried at Khartoum state in 2016 by Elnair also concluded that RUQ pain can lead to different diseases including gall bladder stones, and fatty liver while the current study also included that fatty liver can cause RUQ pain [26]. The current study was done by using ultrasound; it is a safe, easily available and cheap tool for diagnosing pathologies of abdomen. In 2011, Krishnan also found that ultrasound is the best modality for

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diagnosing diseases in patients presenting with RUQ pain [27]. It contains non-ionizing radiations that are safe for the patients and cause no harm. It is a cheap, fast, portable and safe tool for evaluation of different organs of abdomen. A similar study was done by Revzin in 2017 also concluding that ultrasound is the first line modality for diagnosing diseases of RUQ in patients having symptom of pain [2].

CONCLUSIONS

Ultrasound is the gold standard modality for diagnosing abdominal organs diseases as it is a cheap, non-invasive and fast modality. Most common diseases diagnosing in patients with RUQ pain was fatty liver (38.6%), Cholelithiasis and right renal stone was (15.7%).

REFERENCES

[1] Tabidi NAMA. Assessment of Patients with Right Upper Quadrant Pain using Ultrasonography: Sudan University of Science and Technology; 2020.

[2] Revzin MV, Scoutt LM, Garner JG, WS Moore CL. Right upper quadrant pain: ultrasound first! Journal of Ultrasound in Medicine. 2017 Oct; 36(10):1975-1985. doi: 10.1002/jum.14274.

[3] Tortora GJ, Derrickson BH. Principles of anatomy and physiology: John Wiley & Sons; 2018 May.

[4] Scott AS, Fong E. Body structures and functions: Cengage Learning; 2013 March.

[5] Wade CI, Streitz MJ. Anatomy, Abdomen and Pelvis, Abdomen. StatPearls [Internet]. 2021 Jul.

[6] Bennett GL. Evaluating Patients with Right Upper Quadrant Pain. Radiologic Clinics of North America. 2015 Nov; 53(6):1093-130. doi: 10.1016/j.rcl.2015.06.002.

[7] Yarmish GM, Smith MP, Rosen MP, Baker ME, Blake MA, Cash BD, et al. ACR appropriateness criteria right upper quadrant pain. Journal of the American College of Radiology. 2014 Mar; 11(3):316-22. doi: 10.1016/j.jacr.2013.11.017.

[8] Avegno J, Carlisle M. Evaluating the patient with right upper quadrant abdominal pain. Emergency Medicine Clinics of North Amercia. 2016 May; 34(2):211-28. doi: 10.1016/j.emc.2015.12.011.

[9] Gao B, Ahmad MF, Nagy LE, Tsukamoto H. Inflammatory pathways in alcoholic steatohepatitis. Journal of hepatology. 2019 Feb; 70(2):249-259. doi: 10.1016/j.jhep.2018.10.023.

[10] Sánchez-Calvo B, Cassina A, Mastrogiovanni M, Santos M, Trias E, Kelley EE, et al. Olive oil-derived nitro-fatty acids: protection of mitochondrial function in non-alcoholic fatty liver disease. The Journal of Nutritional Biochemistry. 2021 Aug; 94:108646. doi: 10.1016/j.jnutbio.2021.108646

[11] Spence SC, Teichgraeber D, Chandrasekhar C. Emergent right upper quadrant sonography. Journal of ultrasound in medicine. 2009 Apr; 28(4):479-96. doi: 10.7863/jum.2009.28.4.479.

[12] Vezali E, Aghemo A, Colombo M. A review of the treatment of chronic hepatitis C virus infection in cirrhosis. Clinical therapeutics. 2010 Dec; 32(13): 2117-38. doi: 10.1016/S0149-2918(11)00022-1.

[13] Nylund K, Ødegaard S, Hausken T, Folvik G, Lied GA, Viola I, et al. Sonography the small intestine. World journal of gastroenterology. 2009 Mar; 15(11):1319-30. doi: 10.3748/wjg.15.1319.

[14] Mederos MA, Reber HA, Girgis MD. Acute pancreatitis: a review. Jama. 2021 Jan; 325(4):382-390. doi: 10.1001/jama.2020.20317

[15] Patel K, Batura D. An overview of hydronephrosis in adults. British Journal of Hospital Medicine. 2020 Jan; 81(1):1-8. doi: 10.12968/hmed.2019.0274.

[16] Bhavnagri A, Chaudhary T, Chaudhary V, Maheshwari H, Sen DJ. Hydronephrosis: A tale of water inflammation in nephron. World Journal of Pharmaceutical Sciences. 2015:1546-554.

[17] Yilmaz E, Guney S. Giant hydronephrosis due to ureteropelvic junction obstruction in a child: CT and MR appearances. Clinical imaging. 2002 Apr; 26(2):125-8. doi: 10.1016/s0899-7071(01)00369-2.

[18] Hesse A. Urinary stones: Diagnosis, treatment, and prevention of recurrence: Karger Medical and Scientific Publishers. 2009; 213-215.

[19] Khan SR, Pearle MS, Robertson WG, Gambaro G, Canales BK, Doizi S, et al. Kidney stones. Nature reviews Disease primers. 2016 Feb; 2:16008. doi: 10.1038/nrdp.2016.8.

[20] Meola M, Samoni S, Petrucci I. Clinical Scenarios in Chronic Kidney Disease: Cystic Renal Diseases. Contributions to Nephrology 2016; 188:120-30. doi: 10.1159/000445474.

[21] Petrucci I, Clementi A, Sessa C, Torrisi I, Meola M. Ultrasound and color Doppler applications in chronic kidney disease. Journal of Nephrology. 2018 Dec; 31(6):863-879. doi: 10.1007/s40620-018-0531-1.

[22] Vahed LK, Khedmat L. Frequency of symptoms associated with gallstone disease: a hospital-based cross sectional study. European Journal of Translational Myology. 2018 Apr; 28(2):7412. doi: 10.4081/ejtm.2018.7412.

[23] Healey MA, Simons RK, Winchell RJ, Gosink BB, Casola G, Steele JT, et al. A prospective evaluation of abdominal ultrasound in blunt trauma: is it useful? Journal of Trauma and Acute Care Surgery. 1996 Jun; 40(6):875-83; discussion 883-5. doi: 10.1097/00005373-199606000-00004.

[24] Bisset R, Khan AN. Differential diagnosis in

DOI: https://doi.org/10.54393/tt.v3i1.30

abdominal ultrasound: Elsevier India; 2012 Nov.
[25] Mattoon JS, Berry CR, Nyland TG. Abdominal ultrasound scanning techniques. Small Animal Diagnostic Ultrasound-E-Book. 2014 Dec; 94(6):93-112.
[26] Elnair ZA. Assessment of Right Upper Quadrant Pain using Ultrasonography (Doctoral dissertation, Sudan University of Science and Technology).
[27] Krishnan M, Middleton WD. Ultrasonographic evaluation of right upper quadrant pain in emergency departments. Ultrasound Clinics. 2011 Apr; 6(2):149-61. doi.org/10.1016/j.cult.2011.03.004