Indonesian Journal of Global Health Research
Volume 7 Number 2, April 2025
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

CLINICAL SYMPTOMS OF CHOLELITHIASIS AND ABDOMINAL ULTRASOUND FINDINGS IN THE RADIOLOGY INSTALLATION OF RSD

Dewi Damayanti[1]*, Liasari Armaijn[1], Nani Supriyatni[2]
[1]Fakultas Kedokteran, Universitas Khairun, Jl. Pertamina Kampus II Unkhair Gambesi, Ternate Selatan, Ternate, Maluku Utara 97719, Indonesia
[2]Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Maluku Utara, Jl. KH. Ahmad Dahlan No.100, Sasa, Ternate Selatan, Ternate, Maluku Utara 97712, Indonesia
*ddarmayanti77@gmail.com

ABSTRACT
Cholelithiasis is one of the main causes of abdominal pain morbidity worldwide. The prevalence of cholelithiasis in developed countries is around 10-15% of the adult population, while in Asian countries the epidemiology of cholelithiasis ranges from 3-10%, with the prevalence of cholesterol cholelithiasis. This study aims to determine the relationship between clinical symptoms of cholelithiasis and abdominal USG findings at the radiology installation of Tidore Islands City Hospital. Methods: The type of research is observational with a cross-sectional study design. The research was conducted at the Radiology Installation of RSD Kota Tidore Kepulauan. The research sample consisted of 104 patients, with a total sampling method. Data were collected using secondary data obtained from the medical records of patients showing clinical symptoms of cholelithiasis from January to December 2023. data analysis used the Fisher's exact test statistical method. Results and Discussions: The results of the study showed that the characteristics of patients aged 46-65 years were 50 people (48.1%), female gender was 66 people (63.5%), the largest patient clinical was cholelithiasis as many as 98 people (94.2%), the largest patient ultrasound findings were cholelithiasis as many as 98 people (94.2%), the results of the correlation between clinical cholelithiasis and ultrasound findings showed that clinical cholelithiasis with ultrasound findings of cholelithiasis was the most with a total of 95 people. The results of the Fisher's exact test obtained a p value = 0.002, which means that there is a correlation between clinical cholelithiasis and ultrasound findings of cholelithiasis.

Keywords: abdomen; cholelithiasis; USG

How to cite (in APA style)
Darmayanti, D., Armaijn, L., & Supriyatni, N. (2025). Clinical Symptoms of Cholelithiasis and Abdominal Ultrasound Findings in the Radiology Installation of RSD. Indonesian Journal of Global Health Research, 7(2), 487-492. https://doi.org/10.37287/ijghr.v7i2.5501.

INTRODUCTION

Cholelithiasis is one of the most commonly encountered diseases and one of the main causes of abdominal pain morbidity worldwide (Pimpale, Katakwar, and Akhtar, 2019). Cholelithiasis is an abnormal condition where stones form in the gallbladder due to the emulsification process of digestive fluids. The main mechanisms of stone formation include cholesterol supersaturation, excessive bilirubin production, and contractility disorders called hypomotility (Tanaja, Lopez and Meer, 2023). Cholecystitis refers to the inflammatory condition that occurs in the gallbladder. Obstruction of the cystic duct due to stones (cholelithiasis) accounts for about 90-95% of acute cholecystitis cases (Walter, 2022).In the United States, approximately 20 million people (10%-20% of adults) suffer from cholelithiasis. Every year, 1%-3% of people suffer from cholelithiasis and about 1%-3% of people experience symptoms of cholelithiasis. Every year, in the United States, around 500,000 people experience symptoms or complications from gallstones that require cholecystectomy (Heuman,2019). This disease is often found in various countries, including Indonesia. The prevalence rate of cholelithiasis in developed countries is around 10–15% of

the adult population, with a prevalence of cholesterol-type cholelithiasis. Meanwhile, in Asian countries, the epidemiology of cholelithiasis ranges from 3–10%.

The Basic Health Research data from 2018 shows that the prevalence of cholelithiasis in adults is 15.4%, and this prevalence has increased compared to 2016, which was 11.7% (Biantara et al., 2023). Based on an oral cholecystography study, the incidence of cholelithiasis occurs in women at 76% and in men at 36% with an age of over 40 years. As age increases, there is an increase in bile saturation. Meanwhile, women have a 3 times higher risk of developing cholelithiasis than men. This is due to the relationship of estrogen, which influences the increase in cholesterol excretion (Aji, Arania and Maharyuni, 2020). The formation of stones is influenced by several risk factors, such as obesity, lifestyle, age group, and female gender (Siregar, Muhar and Pohan, 2021).The clinical symptoms of cholelithiasis can occur symptomatically and asymptomatically. The clinical symptoms commonly encountered are colicky pain in the right upper quadrant, jaundice in 20% of cases, nausea, and vomiting (Pimpale, Katakwar and Akhtar, 2019). On physical examination, tenderness was found in the right upper quadrant of the abdomen, and a mass or fullness was often palpable. Palpation of the right upper quadrant often causes discomfort. Imaging examinations include ultrasonography (USG), computed tomography scanning (CT-scan), and scintigraphy of the bile ducts. On USG, stones, thickening of the gallbladder wall, fluid in the pericholecystic area, and a positive Murphy sign upon contact between the USG probe and the right upper quadrant abdomen can be found. The sensitivity and accuracy of ultrasound reach 95% (Teruyoshi et al., 2021). Based on the explanation above and due to the lack of research discussing the relationship between clinical symptoms of cholecystitis and abdominal ultrasound findings in North Maluku Province, particularly in Tidore Islands City, this study aims to investigate the relationship between clinical symptoms of cholecystitis and abdominal ultrasound findings at the Radiology Installation of Tidore Islands City Hospital.

METHOD

This type of research is an observational study with a cross-sectional approach. The place and time of the research were at the Radiology Installation of RSD Tidore Islands City from June to August 2024. The population and sample of the study are all patients with clinical symptoms of cholelithiasis at the Radiology Installation of RSD Tidore Kepulauan during the period from January to December 2023. The sample consisted of 104 respondents using the total sampling technique. The data collected comes from the medical records of patients showing symptoms of cholelithiasis. analysis using bivariate analysis with the Fisher's exact test statistical test

RESULT

Patient Characteristics

The patient characteristics found in this study are divided into patient characteristics based on age, gender, clinical, and ultrasound findings.

Patient Age

Based on the patient characteristics by age, it is known that the largest group of patients is those aged 46-65 years, totaling 50 people (48.1%), while the smallest group is those aged <25 years, totaling 3 people (2.9%). The patient characteristics by age can be seen in the following Table 1:

Table 1.

Patient distribution by age

Age	Amount	
	f	%
<25 age	3	2,9
25-45 age	35	33,7
46-65 age >65 age	50	48,1
	16	15,4

Patient's gender

Based on the characteristics of patients according to gender, it is known that the majority of patients are male, with 38 people (36.5%), while female patients number 66 (63.5%). The characteristics of patients based on gender can be seen in the following Table 2:

Table 2.
Distribution of patients by gender

Gender	Amount	
	F	%
Male	38	36,5
Female	66	63,5

Clinical

Based on the clinical characteristics of the patients obtained, it is known that the largest clinical group is cholelithiasis with 98 people (94.2%), while the smallest clinical group is suspected cholelithiasis with 6 people (5.8%). The characteristics of the patients based on clinical symptoms can be seen in the following table 3:

Tabel 3.
Patient distribution by clinical

Clinical	Amount	
	f	%
Suspected Cholelithiasis	6	5,8
Cholelithiasis	98	94,2
Total	104	100,0

USG Findings

Based on the characteristics of the patients according to the USG findings, it was found that the most common USG finding among patients was cholelithiasis, with 98 people (94.2%), while the least common USG finding was other diagnoses, with 6 people (5.8%). The characteristics of the patients based on the radiological results can be seen in the following table 4:

Tabel 4.
Distribution of patients by USG

Clinical	Amount	
	f	%
Cholelithiasis	98	94,2
Other diagnosis	6	5,8

Correlation between clinical cholelithiasis and ultrasound findings

Based on the correlation analysis results, it can be concluded that 3 people with clinically suspected cholelithiasis had ultrasound findings of cholelithiasis, and 3 others with clinically

suspected cholelithiasis had ultrasound findings of other diagnoses. 95 people with clinically diagnosed cholelithiasis had ultrasound findings of cholelithiasis, and 3 others had ultrasound findings of other diagnoses.Based on bivariate analysis using the Fisher's exact test to determine the correlation between clinical cholelithiasis and ultrasound findings, a p-value of 0.002 ($p<0.05$) was obtained. This proves that statistically there is a significant relationship between clinical cholelithiasis and ultrasound findings. This can be seen in the following table 5:

Tabel 5.
Patient distribution by USG

Clinical	USG Findings		Total		P_Value
	Cholelithiasis	Other diagnosis		n%	
Suspected Cholelithiasis	3	3	6	6,0	0,002
Cholelithiasis	95	3	98	94,0	

DISCUSSION

Patient Characteristics

Based on the results of the patient characteristic study, the largest distribution of patients by age is between 46-65 years, with 50 people, accounting for 48.1%. This is consistent with the findings of a study conducted by Anargya Hassya Andini in 2022, where the highest percentage of respondents' ages was in the 46-55 year range or 38.6%, while the age group with the fewest people was 26-35 years or 2.3% (Andini et al., 2023). This is also consistent with the research conducted by Nurhikmah in 2019, which found that the highest proportion of cholelithiasis was in the 40-49 year age group, at 36.8%. (Nurhikmah et al., 2019). Age is the main risk factor for the occurrence of gallstones. Gallstones are very rare in children. The incidence of gallstones increases with age and reaches a relatively high incidence above the age of 40. This can partly be explained by the fact that gallstones rarely dissolve spontaneously and their prevalence is observed due to the cumulative formation of gallstones. Additionally, cholesterol secretion into bile increases with age, and bile acid formation may decrease, resulting in more lithogenic bile (Wulandari et al., 2023). This can also occur because the amount of cholesterol in the gallbladder increases with age. This increase is caused by a decrease in the activity of the enzyme cholesterol 7α-hydroxylase (CYP7A1), which leads to a reduction in the rate of bile acid synthesis, thereby increasing the saturation or viscosity of bile, which can trigger the formation of stones. (Andini et al., 2023).

Based on the results of the patient characteristic study, the distribution of patients by gender showed that the majority were female, with 66 people accounting for 63.5%, while the minority were male, with 38 people accounting for 36.5%. This is consistent with the findings of a study conducted by Anargya Hassya Andini in 2022, which reported that women were more dominant, with 30 respondents or 68.2%, while the remaining were men, totaling 14 or 31.8% (Andini et al., 2023). This is also consistent with the research conducted by Theresia Jamin in 2023, which found that the proportion of female patients was higher than that of male patients, with 18 female patients accounting for 56.25%. (Jamini & Trihandini, 2023). These findings are consistent with the theory that women are twice as likely to develop gallstones compared to men, especially during their reproductive years. This is due to the influence of the sex hormone estrogen, which can increase the absorption of dietary cholesterol and the secretion of bile cholesterol. (Nurhikmah et al., 2019).

Based on the research results, the correlation between clinical cholelithiasis and ultrasound findings shows that clinical cholelithiasis with ultrasound findings of cholelithiasis is the most prevalent, with a total of 95 people. The results of the Fisher's exact test yielded a p-value of

0.002, which can be interpreted as indicating a correlation between clinical cholelithiasis and ultrasound findings of cholelithiasis. This is consistent with the findings of a study by Mawya A Khafaji et al. in 2023, which stated that the results of the chi-square test and one-way ANOVA used showed a p-value < 0.05, meaning there is a relationship between clinical cholelithiasis and ultrasound findings. As many as 178 patients with clinically diagnosed cholelithiasis through ultrasound, and the most common ultrasound finding is gallstones (82.3%). (Khafaji et al., 2023).

Ultrasound is the primary modality for diagnosing gallstones. Point-of-care ultrasound has proven to be as accurate as radiological ultrasound in detecting gallstones in the hands of trained operators. (Tanaja et al., 2023). Ultrasound is the best imaging modality and the gold standard for evaluating cholelithiasis. Ultrasound is also more likely to show classic signs such as RUQ pain and Murphy's sign for diagnosing gallbladder disease. Ultrasound is superior to CT scan for diagnosing cholelithiasis due to its relatively low cost, wide availability, rapid image acquisition, lack of ionizing radiation or contrast agents, enhanced ability to detect gallstones, and the addition of Murphy's sign, which is also preferred (Khafaji et al., 2023).

CONCLUSION

The characteristics of the patients showed that the majority of the patients were female, with 66 people (63.5%). There is a correlation between clinical cholelithiasis and ultrasound findings of cholelithiasis (p=0.002). Ultrasound is the best imaging modality and is the gold standard for evaluating cholelithiasis.

REFERENCES

Board, Editorial. (2024) 'Author Information." Disability and Health Journal 17(3): 1–14.

Editor, Chief. (2019) 'Gallstones (Cholelithiasis)' : 3–5.

Gutt, Carsten, Simon Schläfer, and Frank Lammert. (2020) 'The Treatment of Gallstone Disease' Deutsches Arzteblatt International 117(9): 148–58.

Irgi Biantara et al. (2023) 'Studi Kasus: Penerapan Perioperatif Care Pada Diagnosa Cholelithiasis Dengan Tindakan Operasi Kolesistektomi Laparatomi.' Jurnal Sains dan Kesehatan 7(1): 39–48.

Jones, M.W. et al. (2023) 'Physiology, Gallbladder', StatPearls [Preprint]. Available at:https://www.ncbi.nlm.nih.gov/books/NBK482488/

Jones, M.W., Hannoodee, S. and Young, M. (2022) 'Anatomy, Abdomen and Pelvis: Gallbladder', StatPearls [Preprint]. Available at: https://www.ncbi.nlm.nih.gov/books/NBK459288/ (Accessed: 20 January 2024).

Jones, M.W., Weir, C.B. and Ghassemzadeh, S. (2023) 'Gallstones (Kolelitiasis)', StatPearls [Preprint]. Available at: https://www.ncbi.nlm.nih.gov/books/NBK459370/ (Accessed: 20 January 2024).

Muliani, Irmayanti. (2016) 'Relationship between the Urinary Bladder Capacity with the Incidence of Urinary Retention in Postpartum Physiological Mother.' American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS). 18:297–303

Nasrul, Hafid F, Taqwin. (2017) 'The prevention against morbidity and stunting through vitamin A Supplementation in Sigi and Touna districts.' In: Kusuma K, editor. Pontianak International Health Conference (PIHC). Pontianak: Health Polytechnic of Health Ministry Pontianak; 2017. p. 1–8.

Nasrul, Zainul, Hafid F, Taqwin. (2028) 'Manfaat Media Flipchart dan Spanduk dalam Perilaku Kesehatan 1000 HPK di Sulawesi Tengah.' Media Kesehatan Masyarakat Indonesia. 14(1):52–60.

Patrick C D Gagola, Joan F J Timban, and Ramli Hadji Ali. (2015) 'Gambaran Ultrasonografi Batu Empedu pada Pria & Wanita Di Bagian Radiologi Fk Unsrat Blu Rsup Prof. Dr. R. D. Kandou Manado'

Pimpale, Renu, Pradeep Katakwar, and Murtaza Akhtar. (2019) 'Cholelithiasis: Causative Factors, Clinical Manifestations and Management.' International Surgery Journal 6(6): 2133.

Sigmon, D.F., Dayal, N. and Meseeha, M. (2023) 'Biliary Colic', Decision Making in Medicine: An Algorithmic Approach: Third Edition, pp. 194–195. Available at: https://doi.org/10.1097/00000542-196103000-00084.

Tanaja, J., Lopez, R.A. and Meer, J.M. (2023) 'Kolelitiasis', Indian Journal of Practical Pediatrics, 20(2), pp. 101–106. Available at: https://doi.org/10.5005/jp/books/12296_29.

Walter, K. (2022) 'Acute Cholecystitis', JAMA, 327(15), pp. 1514–1514. Available at: https://doi.org/10.1001/JAMA.2022.2969.

Yoo, K.S. (2018) '[Management of Gallstone]', The Korean journal of gastroenterology = Taehan Sohwagi Hakhoe chi, 71(5), pp. 253–259. Available at: https://doi.org/10.4166/KJG.2018.71.5.253

Siregar, Denny Rifsal, Adi Muradi Muhar, and Doddy Prabisma Pohan. (2021) 'The Role of Cholelithiasis Risk Factors in Stone Types in Cholelithiasis Patients at Universitas Sumatera Utara Hospital.' Bali Medical Journal 10(1): 63–65.

Teruyoshi, Oda et al. (2021) 'Acute Cholecystitis: Comparison of Clinical Findings from Ultrasound and Computed Tomography.' Journal of Clinical Gastroenterology and Treatment 7(1): 1–5.