Jurnal edu Healt
Volume 15 , Number 02, 2024, DOI 10.54209/eduhealth.v15i02
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Characteristics Of Anorectal Malformation Patients

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Article Info
Keywords:
Canorectal malformations,
Patient,
characteristic

ABSTRACT
Anorectal malformations represent a broad spectrum of abnormalities in the formation of the anus and rectum ranging from stenosis to anorectal agenesis. The mortality rate of patients with high anorectal malformations is higher than that of low anorectal malformations due to the higher incidence of comorbidities in high anorectal malformations. The incidence of anorectal malformations is still relatively low, while the characteristics of anorectal malformations based on classification, gender, age, birth weight. The method used is literature review with Narrative Review design. The results obtained in this literature are that there are 15 articles obtained with restrictions from 2018-2023 and in-depth analysis of the strengths and limitations of each article regarding the incidence and characteristics of anorectal malformations, 12 articles mention the incidence and characteristics of anorectal malformations and 3 articles only mention the incidence of anorectal malformations.

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INTRODUCTION

Anorectal malformation (ARM) is still a problem, because it is the most frequently encountered pediatric surgical case and is associated with high morbidity, so it is necessary for medical experts and lay people to immediately recognize the diagnosis of this congenital disease. If not diagnosed at birth, anorectal malformations usually present later in life with bowel movement defects. Long-term management of chronic bowel-related symptoms and surgery depending on the type and severity of the anorectal malformation remain the primary treatment modalities. Early recognition and management is recommended in the treatment of children with anorectal malformations to prevent sepsis and other morbidity associated with intestinal obstruction. Mortality in patients with anorectal malformations can be caused by the location of the malformation and accompanying congenital diseases. Deaths of neonates with MAR due to late diagnosis or late surgery also often occur, especially in developing countries. Health facilities that are far from where one lives and the unavailability of pediatric surgical facilities and specialists are still problems. Several hospitals in Indonesia have published research data on the incidence and characteristics of anorectal malformation patients. However, there has not been much research regarding the incidence and characteristics of anorectal malformations (ARM) in

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Makassar City hospitals.

Anorectal malformations are a broad spectrum of abnormalities in the formation of the anus and rectum, ranging from stenosis to anorectal agenesis. The incidence of this event worldwide is 1 per 5,000 live births, although in certain regions it is found more frequently. 1, 3, 4 The cause is unknown, but some sufferers have a genetic predisposition to anorectal malformations in previous generations.

Anorectal malformation (ARM) is a relatively common congenital anomaly in pediatric surgery, with an incidence of 1 in 4,000 to 5,000 births. In addition, 50%-60% of patients with ARM are known to have at least one other congenital abnormality.9 According to data from the Global Report on Birth Defects, various data from the Ministry of Health of the Republic of Indonesia in the Southeast Asia region of Indonesia, out of 1000 births, there are 59.3% of babies with abnormalities. default. Data from the Maternal Perinatal Installation at RSUP Dr. Sardjito for the period 1 January 2013-31 December 2019. There were 188 MAR neonates from all neonates treated in the perinatal care ward and NICU. 10 Data from RSUP dr. Mohammad Hosein Palembang from January 2015 to June 2017. Of the eighty-two cases of anorectal malformations, nineteen cases experienced mortality (23.2%). Of the four risk factors studied, two risk factors were found that had a significant effect on the mortality of anorectal malformation patients, namely the type of anorectal malformation (p value = 0.036) and sepsis (p value = 0.049). Factors that have a significant relationship to the mortality of anorectal malformation patients are the type of anorectal malformation and sepsis, while accompanying congenital abnormalities and prematurity have no effect on the mortality of anorectal malformation patients.

The factors associated with the presence of accompanying congenital abnormalities in anorectal malformation patients are currently still unknown. Antenatal diagnosis of anorectal malformations (ARM) is rare, and most of these cases are diagnosed in the neonatal period. 11 Newborns are evaluated during 24 to 48 hours of life if the child is developing ARM then it is best to be treated in the neonatal area. Treatment and long-term clinical outcomes of children with anorectal malformations (ARM) have always been one of the main concerns of pediatric surgeons. Therefore, it is important to conduct research on the incidence and identification of the characteristics of anorectal malformations in the city of Makassar.

The benefit of this research is knowing the incidence and characteristics of anorectal malformation patients (type of malformation, gender, gestational age, birth weight). Paying attention to the problem of anorectal malformation, it is necessary to look for solutions to the problem, because anorectal malformation has serious complications if not treated properly and immediately. With the large number of anorectal malformations occurring in children, researchers are interested in conducting further research related to the incidence and characteristics of anorectal malformations.

METHOD

This research is a Literature Review research with a Narrative Review design. This method is used to identify, review, evaluate, and interpret all available research. By using this method, a systematic review and identification of journals can be carried out, with each

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process following predetermined steps or protocols. This research also used the PICO method to search for literature.

The type of data in this research is secondary data, namely databases from various references, such as research journals, review journals, annual reports, books and data relating to the characteristics of cholelithiasis patients published in 2018-2023. Literature searches were carried out through electronic databases, namely Google Scholar, Clinical Key, PubMed, Researchgate, national survey results such as RIKESDAS, PSG and WHO, searched using the keywords: Anorectal malformation. Content analysis was carried out using a synthesis table by comparing research methods, research subjects and objects, as well as variables studied including the incidence and characteristics of anorectal malformations.

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RESULTS AND DISCUSSION

NO	Authors	Publisher	Objective study	Subject	Method	Result
1	Leal GA et al (2023)	World Journal of Surgery and Surgical Research	This investigation aims to describe the main clinical aspects and therapeutic outcomes associated with anorectal malformations within the scope of our study period.	22 patients diagnosed with anorectal malformations between January 2009 and June 2016,	This study conducted a retrospective and prospective analysis	Findings showed that 59.1% of cases showed low birth weight, with a predominance of male cases. Associated malformations were present in 35.2% of cases, affecting the digestive system and bones. High anorectal malformations were found in 37% of male cases. The most frequently performed surgical technique is posterior sagittal anorectoplasty, and 50% of children undergo surgery before their first birthday. Postoperative complications were recorded in 31.2% of cases, with a mortality rate of 19.1%.
2	Jing Li et al (2020)	The Journal of Maternal-Fetal & Neonatal Medicine	To analyze the clinical characteristics and prognosis of anorectal malformations (ARM) and explore the factors influencing postoperative anal function in Anhui Province, China.	A total of 332 babies with ARM were registered in this survey.A total of 332 babies with ARM were registered in this survey.	We conducted a retrospective study of ARM patients diagnosed from 2013 to 2016 at Anhui Provincial Children's Hospital.	A total of 253 men and 79 women were studied, with a ratio of 3.2:1. Abdominal distension is the most frequent symptom, followed by vomiting. Of these cases, 53.0% (176/332) were combined with other congenital abnormalities. The incidence of other malformations in the intermediate and high ARM groups was significantly higher than that in the low ARM group. Of these cases, 280 cases underwent anoplasty. A total of 188, 73, 19 cases were treated with one-stage perineal anoplasty, posterior sagittal anorectoplasty, laparoscopic assisted anorectoplasty respectively. The results of the follow-up study showed that the rate of excellent and good postoperative anal function reached 83.3%. The type of ARM, combined with other malformations and the timing of anoplasty are associated with postoperative anal function.
3	Rahmi M et al (2020)	Malaysian Journal of Medicine and	The aim of this study was to apply the Krickenbeck	72 patient	Retrospective study	This study involved 72 patients: 38 men and 34 women. Based on the Rintala scoring system, 94.4%, 90.2%, 60%, 83.3%, and 60% of patients showed no stool, no constipation, able to hold bowel

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		Health Sciences	classification and Rintala scoring system to determine the type of ARM and functional outcome.			movements, frequency of bowel movements once every two days to twice a day, and feel/report an urge to defecate. In addition, none of the patients experienced accidents or social problems. Normal and good Rintala scores were demonstrated in 14 (19.4%) and 55 (76.4%) patients, respectively. Female patients had a 4.2 times higher risk of showing more/less frequent bowel movements compared to male patients (95% confidence interval (CI) = 1.03-17.1; p=0.035).
4	Indra B dkk (2018).	Sriwijaya Medical Magazine	Identified the relationship between the type of anorectal malformation, accompanying congenital abnormalities, sepsis, and prematurity with the mortality of anorectal malformation patients.	Secondary data collection was obtained from eighty-two medical records of anorectal malformation patients at RSUP Dr. Mohammad Hoesin Palembang for the period January 2015 to June 2017 who met the inclusion criteria	This research is an analytical observational study with a cross sectional study design	Of the eighty-two cases of anorectal malformations, nineteen cases experienced mortality (23.2%). Of the four risk factors studied, two risk factors were found that had a significant effect on the mortality of anorectal malformation patients, namely the type of anorectal malformation (p value = 0.036) and sepsis (p value = 0.049). Factors that have a significant relationship to the mortality of anorectal malformation patients are the type of anorectal malformation and sepsis, while accompanying congenital abnormalities and prematurity have no effect on the mortality of anorectal malformation patients.
5.	Ogundoyin O et al (2021)	PanAfrican Medical Journal	The aim of this study was to examine the characteristics of anorectal	All patients treated for anorectal malformations from January	This research is a retrospective descriptive study	Eighty-eight children with anorectal malformations consisting of 61 (69.3%) boys and 27 (30.7%) girls were studied with 76 (86.3%) patients presenting within the first year of life. Low anorectal malformation was found in 14 (15.9%) patients, 71 (80.7%) patients had intermediate or high malformation and cloacal

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			malformations with the challenges associated with treatment and outcomes	2003 to December 2017 were studied in Ibadan, Nigeria.		malformation was found in 3 (3.4%) patients. Associated congenital malformations were observed in 18 (20.5%) patients with 10 (55.6%) patients associated with intermediate or high malformations and the urogenital system was the most common system whose anomalies were associated with anorectal malformations in 12 (13.6%) patient. Anoplasty was performed in 14 (15.9%) patients, posterior sagittal anorectoplasty was performed in 67 (76.1%) patients, abdominosacroperineal pull through in 4 (4.6%) patients, and posterior sagittal anorectovaginourethroplasty in 3 (3.4%) patient. Six (6.8%) neonates died.
6	Rosas-Blum et al. (2020)	Journal of Pediatric Gastroenterology and Nutrition	The purpose of this study was to characterize ARM in children in the El Paso area and describe various features of ARM specific to children living along the US-Mexico border.	37 patient	This retrospective study conducted at a single institution focused on the epidemiological profile of ARM in the Hispanic population in the United States.	Of the 37 patients included in this study, 20 were men and 17 were women. The most common ARMs were rectoperineal fistulas (46%), rectourethral fistulas, and cloacal malformations. Constipation is the most common long-term complication, especially in patients with recto-perineal fistulas.
7	Insanilahia T (2022)	Jambi University Faculty of Medicine and Health Sciences	The aim of this research is to determine the characteristics of anorectal malformation patients treated at	56 samples of anorectal malformation patients treated at Raden Mattaher Hospital Jambi in	This research uses a descriptive cross research method sectional which uses secondary data in the form	Of the 56 samples obtained, the initial age at the time of surgery was <2 days for the majority of 25 patients (44.6%). The male gender was dominant in 36 patients (64.3%). Most were born at sufficient gestational age (85.7%), most birth weights were >2500 gr (76.8%) and Apgar scores were dominated by no asphyxia, 85.7%. The most common type of atresia ani is the major clinical group. In this study, 67.9% were not accompanied by

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			RSUD Raden Mattaher Jambi 2017-2021.	2017-2021.	of medical record data.	accompanying congenital abnormalities. The congenital disorders in this study were VACTERL and Down syndrome. The surgical procedure, namely colostomy, was 85.7%. The number of patients alive in this study was 73.2%.
8	Oh C et al (2020)	Journal Korean Medical Science	To determine the incidence of AA with ARM subtypes classified according to the Krickenbeck classification and analyze differences in the incidence rates of major and minor AA according to organ systems.	A total of 460 patients	We retrospectively analyzed congenital anomalies in patients undergoing ARM anoplasty at our institution.	Results: Of 460 patients, 256 (55.7%) were men, 299 (65%) had at least one anomaly, and 274 (59.6%) had major AA. According to organ system, AA most commonly occurs in the genitourinary (2.8%), cardiovascular (2.5%), and spinal/vertebral systems (22.6%). Primary AA occurs most frequently in the cardiovascular (23%) and spinal/spine and genitourinary systems (19.3%). According to ARM subtype, AA was common in the order of cloacal (93.9%), rectovaginal fistula (85.7%), and bladder neck fistula (85%). For the incidence of AA, cloaca (OR, 15.7) and bladder neck fistula (OR, 5.74) showed significantly higher ORs. In the analysis of major AA, cloaca (OR, 19.77) showed the highest OR, followed by no fistula (OR, 4.78) and bladder neck fistula (OR, 3.83).
9	Almatrafi M et all (2020)	Saudi Medical Journal	To determine risk factors for development of anorectal malformations (ARM).	48 sampel	This case-control study was conducted at the Mother and Child Hospital (MCH), Al Madinah Al Munnawarah, Saudi Arabia	This study involved 48 cases and 96 controls with 31 (64.6%) cases of isolated ARM and 17 (35.4%) cases of associated ARM. Among ARM cases, 27 (56.3%) were men and 21 (43.8%) were women. In multivariate analysis, we found that consanguinity was associated with an increased risk of developing ARM with odds ratio (OR): 2.43, 95% CI: 1.12-5, and p=0.025, in addition to maternal obesity, with OR: 4.36, 95% CI: 1.2 -15.8, and p=0.025.
10	Kancherla V et al. (2023)	HHS Public Access	To examine the total prevalence, prevalence trends,	A total of 9,438 cases of ARM were recorded	Study kohort retrospektif	The total prevalence of ARM was 3.26 per 10,000 total births (95% Confidence Interval = 3.19, 3.32) for birth years 1974-2014. About 60% of these cases are multiple or syndromic cases. The

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			and age-specific mortality among individuals with anorectal malformations (ARM)	during the study period between 1974 and 2014 across all 24 programs that contributed to this research		prevalence of twins, syndromes, and stillbirths decreased from 2001 to 2012. The proportion of deaths in the first week was 12.5%, 3.2%, 28.3%, and 18.2% among all cases, single cases, multiple, and syndrome, respectively.
11	Schmitt F et al (2021)	Journal of Pediatric Gastroenterology and Nutrition	This study aimed to assess the long-term functional outcomes of children with anorectal malformations (ARM) across a network of expert centers in France.	367 patient	Retrospective cross-sectional study	Among the 367 patients, there were 155 women (42.2%) and 212 men (57.8%), 188 (51.2%) cases with and 179 (48.8%) cases without perineal fistula. Univariate and multivariate statistical analysis with logistic regression showed a correlation between the degree of rectal blind pouch and voluntary defecation (odds ratio [OR] 1.84 [1.31- 2.57], P < 0.001), or bed-wetting (OR 1.72 [1.31 - 2.57], P < 0.001), or bedwetting (OR 1.72 [1.31 - 2.57], P < 0.001). 72 [1.31 - 2.25], P < 0.001), which was also associated with the inability to differentiate between stool and gas (OR2.45 [1.28-4.67], P0.007) and the presence of constipation (OR2.97 [1.74-5.08], P<0.001). Risk factors for constipation were sacral abnormalities (OR 2.26 [1.23 - 4.25], P 0.01) and surgical procedures without abdominal approach (OR 2.98 [1.29 - 6.87], P 0, 01). Just hold your bowel movements voluntarily and at a rate
12	Jennifer Ahn et al (2023)	The Journal of Urology	We aimed to evaluate the current practice of urological evaluation in individuals with anorectal malformations	A total of 427 patients	We performed a multicenter retrospective study of children with ARM evaluated at various sites participating in	A total of 427 subjects with ARM from 13 institutions were included, and only 22% (93/427) of subjects had a urologic evaluation recorded within 12 months of ARM diagnosis. For imaging studies performed within 12 months of ARM diagnosis, 25% (112/427) underwent renal ultrasound, 8% (34/427) underwent voiding cystourethro- gram (VCUG), and 1% underwent renal scanning. Renal abnormalities were reported in 58 subjects, with hydronephrosis most commonly seen, followed by horseshoe

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			using a multi-center registry.		the Pediatric Colorectal and Pelvic Learning Consortium (PCPLC).	kidney and ectopic kidney. Vesicoureteral reflux was detected in 20 subjects, comprising 59% of those undergoing VCUG. On univariate analysis, performing renal ultrasound within 12 months after ARM diagnosis was not associated with clinical characteristics, such as ARM complexity or spine/sacrum status. This was associated with Hispanic ethnicity (OR 1.73, CI 1.04, 2.84, p [0.034]).
13	Vicentia P (2022)	General Practitioner Education Study Program, Faculty of Medicine, Sriwijaya University	Knowing the characteristics of patients with anorectal malformations in children at RSUP Dr. Mohammad Hoesin Palembang in the period January 2019 - December 2021.	The total sample was 41 patients at RSUP Dr. Mohammad Hoesin Palembang	This research is a descriptive observational study with a cross-sectional design using a total sampling method	From this study, results were obtained from a total sample of 41 patients with the highest percentage occurring in males (73.2%), diagnosed at 0-7 days (97.6%), history of gestational age >37 weeks (95.1%), age treated more than 24 hours (65.9%), classification of anorectal malformation without fistula (73.3%), history of birth weight 2500-4000 grams (90.2%), without accompanying abnormalities (82.9%), colostomy management (80.5%), no complications (92.7%), treated in the ward (53.7%), final mortality (92.7%).
14.	Matteo Cassina (2019)	Journal of Pediatric Surgery	The aim of this study was to describe the epidemiology of anorectal disorders between 1981 and 2014 and to evaluate patient survival.	A total of 428 samples	Retrospective observational study	A total of 428 individuals with ARM were identified, with an overall prevalence of 3.09 per 10,000 births. Characteristics associated with reduced survival were low birth weight (< 2500 g) (HR 6.4; 95% CI, 2.3-17.9), presence of two or more additional major defects (HR 7.9; 95 % CI, 2.2-27.8), and birth before 2000 (HR 4.7; 95% CI, 1.8-11.8). The 10-year survival probability is 100% for individuals with isolated ARM, regardless of their birth weight. Survival of patients with non-isolated ARM varied according to their year of birth and birth weight: 73.3% (° 2500 g) and 23.8% (<° 2500 g) in children born before 2000; 97.9% (° 2500 g) and 68.8% (<° 2500 g) in children born after 2000.
15.	Mega	Fakumi Medical	The aim of this	This research	This research is	Based on research that has been conducted, the majority of

	Islamiaty dkk (2023)	Journal: Jurnal Mahasiswa Kedokteran	research is to determine the characteristics of anorectal malformations in hospitals. Bhayangkara & RSIA Sitti Khadijah 1 Makassar 2017 – 2022	involved 13 samples. Anorectal malformation patient in hospital. Bhayangkara & RSIA Sitti Khadijah 1 Makassar 2018 – 2022	a retroprospective descriptive study with a cross sectional approach.	anorectal malformation patients at Bhayangkara Hospital and RSIA Sitti Khadijah 1 Makassar are male (69.2%), have a history of maternal ANC frequency of 4 times (46.2%), and do not have mother's history of taking medication during pregnancy (61.5%). It was also found that the mean birth weight was 2,661 ± 787 grams, the gestational age was 38 ± 1.5 weeks, and the mother's age at delivery was 30 ± 6.7 years. The incidence of anorectal malformations in Makassar is still low. From the two research data obtained, there was not a significant difference between the two hospitals, Rs. Bhayangkara and RSIA Sitti Khadijah 1 Makassar
16.	Gloria Pelizzo dkk (2023)	Cureus	The aim of this study is to identify the ideal operating time to achieve continence and quality of life which is better anorectal malformation nhm	This research involved 74 samples.	Retrospective research	Overall, 74 patients were recruited (mean age 13.05 ± 2.80 years), and data analysis showed a significant association between comorbidities and surgical time. In addition, the timing of surgery is also related to the final results in terms of fecal continence (better if surgery is performed before 3 months) and Quality of Life (QoL). However, QoL is influenced by other factors (emotional and social life, psychological environment and chronic disease treatment).
17.	Roshan Chanchlani dkk (2023)	Cureus	This study was conducted with the aim of finding the incidence of various types of ARM and associated anomalies, and emphasizing the	This research involved 100 samples.	This research is a retroprospective descriptive study with a cross sectional approach.	Of the 63 high type cases, 84.12% were male and 15.87% female. Of the 37 patients with low type, 43.24% were men and 56.75% were women. Genitourinary system anomalies were present in 22 (34.92%) of 63 high ARM cases and 10 (27.02%) of 37 low ARM cases. In male patients, anocutaneous fistula was found in 16 (23.18%) cases. Of the 31 women in this study, anorectal agenesis with anovestibular fistula was seen in 19 (61.29%) cases. In early complications, significant bleeding and urethral injury were seen in one (2.63%) patient each. However, among late complications, anal

			importance of timely treatment of these anomalies to minimize overall morbidity and mortality in children suffering from ARM.			stenosis, mucosal prolapse, and wound infection were seen in seven (18.42%), five (13.15%), and four (10.52%) patients, respectively.
18.	Sarita Chowdhary dkk (2020)	African Journal of Paediatric Surgery	We have conducted this study for TEF with Anorectal malformation and TEF without Anorectal malformation in terms of age, gender, surgical outcome, and mortality.	The participants in this study were 236 patients	This research is a retroprospective descriptive research	The incidence of tracheoesophageal fistula with ARM was 11.1%. This study had more men. All cases were Type c except two Type a cases. According to the ARM classification, there were two cases with rectourethral fistula and eight cases with rectoperineal fistula and closed anus in men. In women, there was a varied distribution with seven cases. There was one case (4%) that arose as part of an association of anorectal vertebral, tracheoesophageal heart, kidney and extremity malformations (VACTERL), which is a representative example of a complex anomaly. Most cases die due to heart problems and pneumonitis (due to late presentation).
19.	Melanie Kapapa (2021)	Pediatrics and Neonatology	The aim of this study was to evaluate possible prenatal risk factors for ARM in a tertiary hospital.	The participants in this study were 236 patients	This research is a case control study	Our results show that ARM couples have a significantly higher age difference (p Z 0.028) compared to CG couples. ARM mothers had more abnormalities during pregnancy (p Z 0.002), more vaginal smears positive for group B streptococci (p Z 0.024), urogenital infections (p Z 0.005), gestosis (p Z 0.03), emesis (p Z 0.025), and more chronic diseases (p Z 0.018). ARM mothers took fewer medications during pregnancy (p Z 0.013) than CG mothers including folic acid (p Z 0.041); intake of iodine tablets was significantly higher (p Z 0.035) and they continued smoking longer

						(p Z 0.036) than CG mothers, as well as experiencing more stillbirths (p Z 0.035). In terms of use of illegal drugs and alcohol, the two groups did not show significant differences. ARMa was present in 68.1% (n Z 30), of which 45.5% were of urogenital origin (n Z 20). The diagnosis of ARM was made on the first day of life in 72.7% (n Z 32), while the diagnosis was delayed in 12 patients (27.3%).
20	Anna Svenningsson dkk (2018)	Journal Pediatry Surgery .	The aim of this study was to assess maternal risk factors and perinatal characteristics in patients with anorectal malformations (ARM) in Sweden.	Participants in this study were 1167 patients	This research is a case control study	A total of 1167 patients and 5835 controls were analyzed. Patients with ARM were more often born premature (<35 weeks: OR 4.81 95% CI 3.42-6.75, 35-36 weeks OR 2.96 95% CI 2.13-4.11) or small for age pregnancy (SGA) (OR 3.82 95% CI 2.66-5.50). Maternal BMI ≥30 was associated with increased risk of ARM (OR 1.42; 95% CI 1.08-1.86). Maternal smoking ≥10 cigarettes per day was associated with ARM only in patients without associated malformations (OR 1.67 95% CI 1.08-2.58).

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Fifteen articles were analyzed using a synthesis table to look at the variables studied by each study, the incidence and characteristics of anorectal malformation patients. Of the 20 articles discussing the incidence and characteristics of anorectal malformation patients, 16 articles mentioned the incidence and gender characteristics (journals 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 15, 17, 18 , 19, 20), 4 articles only mentioned the prevalence of anorectal malformation cases (Journals 10, 12, 14, 16). fifteen articles used a retroprospective descriptive design (journals 1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 14, 15, 16, 17, 18), one article used an observational descriptive study (journal 13) , one article uses an analytical observational study (journal 4), three articles use a case control study.

One of the strengths of these articles is the use of nationally and internationally representative data with the latest editions and large sample sizes sufficient to analyze the incidence and characteristics of anorectal malformation patients. In addition, several variables may be significant risk factors for anorectal malformations. This is important so that interventions can be carried out to reduce the risk of anorectal malformations and to know whether these factors influence the occurrence of anorectal malformations.

One limitation that needs to be considered in several of these articles is that the use of literature review data can experience bias in the selection of data sources used. Researchers may tend to select data that fits their hypothesis, which can influence research results and introduce bias in the study. The data sources available in a literature study may not be complete to answer all research questions. In addition, some articles use less population coverage. In the analysis of the characteristics of anorectal malformations in the article, it was limited only to gender characteristics, some characteristics of anorectal malformations were not included in the study. This is to ascertain whether the exclusion criteria allow for selection bias. Thus, the authors suggest future research with better methodology, larger sample sizes, and more variables. Further research is needed to discuss other factors regarding the characteristics of anorectal malformations by implementing interventions to reduce risk factors.

Furthermore, the authors identified 7 articles that discussed the characteristics of anorectal malformation patients based on age (journals 7, 10, 13, 16, 18, 19, 20), one article used an observational descriptive design (journal 13), three articles used a retroprospective descriptive design (journal 13). journals 7, 16, 18), one article used a retroprospective cohort design (journal 10) and two articles used a case control design (journals 19, 20). The author identified several similarities between these articles, namely that the journals are still very recent, although there are several journals that have less population, some of these studies mention a wider range of variables.

There are 3 articles that discuss the characteristics of anorectal malformation patients based on classification (journals 4, 6, 13), two articles use a descriptive observational design (journals 2, 6), one article uses an analytical observational design (journal 6). The author identified several differences between the articles, namely that the results of the analysis contained differences regarding the highest number of anorectal malformation classifications, this could be due to different locations and sample populations. One of the strengths of some of these articles is that the discussion is very detailed and detailed, prepared using certain procedures or stages, presenting abstracts and conclusions that are

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easy to understand.

Discussions

Anorectal Malformations (ARM) are congenital abnormalities involving the lower gastrointestinal, urogenital, and/or gynecological systems. Anorectal Malformations (MAR) are considered one of the most common congenital intestinal anomalies with an incidence of 1 in 4000 - 5000 births, with a low prevalence more in boys than girls. The incidence of this event throughout the world The cause is unknown, but some sufferers have a genetic predisposition to anorectal malformations in previous generations. The incidence of anorectal malformations in Europe between regions varies between 1.14 to 5.96 per 10,000 people and can change every year. The incidence in Al-Madinah Al Munnawarah, Saudi Arabia is estimated at 1/1000, which is higher than the reported incidence in many countries.

The pathophysiology of anorectal malformations begins during the fetal development phase at weeks 7-10, where there is failure to form the complete urorectal septum due to impaired growth, fusion or formation of the anus from the embryonic protrusion, so that the anus and rectum develop from the embryonic back. 21,22 Classification of malformations anorectals are divided according to gender. In men, namely perineal fistula, rectourethral fistula (bulbar, prostatic), rectovesical neck fistula, imperforate anus without fistula, rectal atresia, and complex defects. Women, namely perineal fistula, vestibular fistula, persistent cloaca (<= 3 cm or >3 cm cm from the proper opening), imperforate anus without fistula, rectal atresia, complex defects.

Several diagnostic tests are required for patients diagnosed with anorectal malformations. Although anorectal malformations may occur as a discrete finding, they require additional workup because 60% of patients have associated anomalies, and there is a correlation between anorectal malformations and VACTERL abnormalities (vertebral, anorectal, cardiac, tracheoesophageal/athesophageal fistula, renal, and extremities). 25,26,27

Depending on the type of ARM, different management strategies and surgical procedures are performed. The surgical procedure for low-grade malformations is posterior sagittal anorectoplasty (PSARP), which was first described by Pieter deVries and Alberto Peña in 1982. If a perineal fistula is found, treatment is anoplasty. If rectal gas is found below the coccygeus and there is no associated defect, the treatment carried out is consideration of PSARP with or without colostomy. If rectal gas is found below the coccygeus, there is an associated defect, sacrum abnormalities, and a flat bottom, the treatment carried out is a colostomy. Newborn girls with anorectal malformations should be evaluated for anomalies in the sacrum, esophagus, spine (tethered cord), kidneys, and heart. If there is a cloaca, the urological system must be evaluated and whether there is hydrocolpos. The actions taken include colostomy, hydrocolpos drain, and urinary diversion. If there is a perineal fistula, treatment includes anoplasty or dilatation. If there is a vestibular fistula, the treatment is colostomy or primary repair. If no fistula is found, within 24 hours a cross table lateral X-ray is performed. After imaging, the rectum was found below the coccygeus, treatment was a colostomy or primary repair. If a high rectum is found, treatment is a colostomy. Constipation is the most common complication after ARM

Jurnal edu Healt
Volume 15 , Number 02, 2024, DOI 10.54209/eduhealth.v15i02
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

surgery.

Based on the results of research conducted by Pricilia et al (2022), it was found that the majority of characteristics of anorectal malformations occurred in males (73.2%), diagnosed at 0-7 days (97.6%), history of gestational age ≥ 37 weeks (95.1%), age treated more than 24 hours (65.9%), classification of anorectal malformation without fistula (73.3%), history of birth weight 2500-4000 grams (90.2%), without accompanying abnormalities (82.9%), colostomy management (80.5%), no complications (92.7%), treated in the ward (53.7%), final mortality (92.7%).

Another research conducted by Insanilahia T (2022) on the characteristics of anorectal malformation patients at Raden Mattaher Jambi Regional Hospital in 2017-2021 was 56 patients. Of the 56 samples obtained, the initial age at the time of surgery was <2 days for the majority of 25 patients (44.6%). The male gender was dominant in 36 patients (64.3%). Most were born at sufficient gestational age (85.7%), most birth weights were >2500 gr (76.8%) and Apgar scores were dominated by no asphyxia, 85.7%. The most common type of atresia ani is the major clinical group. In this study, 67.9% were not accompanied by accompanying congenital abnormalities. The congenital disorders in this study were VACTERL and Down syndrome. The surgical procedure, namely colostomy, was 85.7%. The number of patients alive in this study was 73.2%.

CONCLUSIONS

Based on the results of identification and several studies in this literature review, it can be concluded that the incidence and characteristics of gender are the most dominant factors in this literature review, followed by age and classification of anorectal malformations. Although there are several other characteristics such as history of ANC, history of drug consumption, gestation, history of LBW. The suggestion suggested by the researcher is for further research to analyze whether the incidents and characteristics found in this study are a risk factor for the occurrence of anorectal malformations or not through analytical type research, as well as using a wider hospital coverage in order to obtain a larger number of research subjects. . And for clinicians to be aware of the occurrence of anorectal malformations in fetuses that have identical characteristics to the characteristics of the subjects of this study, so that management planning can be better prepared.

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