Case Study

Rare Causes of Acute Urinary Retention in a Resource Poor Setting in Nigeria: A Descriptive Case-Based Study

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Abstract

Background: Acute urinary retention (AUR) is a medical emergency characterized by the sudden inability to void despite a full bladder.

Objective: This study was aimed at assessing the prevalence of rare causes of AUR and their causes.

Methodology: This was a retrospective study over a period of five years in which all the medical records of patients were retrieved and information on acute urinary retention extracted from them and transferred to a data sheet. Those whose records were grossly deficient were excluded from the study. Hence 3652 folders were reviewed out of which 53(1.45%) folders were for patients that had AUR. Two (3.77%) of these 53 folders were females and 51(96.22%) were males, of which one of the males (1.96%) was an infant. Rare causes of urinary retention in the hospital clinic were found in four (7.45%) of the patients.

Conclusion: The primary care physician needs a high index of suspicion to be able to arrive at the correct diagnosis. Understanding rare AUR causes in resource-poor settings enhances diagnostic accuracy, reduces iatrogenic harm, and aligns treatment with local disease patterns.

Keywords: Acute urinary retention, rare causes, non-urological etiologies, unusual presentations, primary care, diagnostic challenges, resource-poor settings

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Introduction

Acute urinary retention (AUR) is a medical emergency characterized by the sudden inability to void despite a full bladder. It is a condition frequently encountered in clinical practice, especially among older men, primarily due to benign prostatic hyperplasia (BPH) and urethral strictures. Rare causes of acute urinary retention (AUR) are unusual or unexpected conditions that precipitate an inability to pass urine, often complicating diagnosis and management, especially in low-resource settings.[1] The inability to diagnose numerous diseases rapidly is a significant cause of the disparity of deaths resulting from both communicable and non-communicable diseases in the developing world in comparison to the developed world. Existing diagnostic instrumentation usually requires sophisticated infrastructure, stable electrical power, expensive reagents, long assay times, and highly trained personnel which is not often available in limited resource settings.[2] Rare causes of AUR in rural practice have been reported in India, caused by a large bladder stone in a young male farmer with a history of chronic dehydration and in sub-Saharan Africa in a woman due to a massive uterine fibroid.[3,4]

Other rarer causes include neurogenic causes, malignancies, and anatomical abnormalities, which require thorough clinical evaluation and a high index of suspicion.[5] In rural medical settings, were access to advanced diagnostic facilities
may be limited,[6] the ability to recognize and manage these uncommon causes is
essentially based heavily on reliance on clinical judgment[7] Prompt and appropriate
management is therefore imperative to prevent complications. Understanding these rare etiologies is essential for prompt and effective management, especially in resource-constrained environments like Nigeria. This study seeks to determine the prevalence of rare causes of AUR in a primary care facility. It will describe clinical presentations, diagnostic approaches, and outcomes associated with rare causes of
AUR and identify demographic characteristics of the patients. This approach minimizes complications, conserves scarce resources, and addresses gaps in specialized care. This would increase the awareness of the primary care physician to the existence of theses rare causes of AUR. We shall occasionally interchange rural settings and resource poor settings since many **rural settings** are also **resource-poor**, particularly in low- and middle-income countries.[78]

Methodology

The setting

The study was carried out at the Bethesda Family Hospital, a 10-bed health care delivery center. The hospital is located in Port Harcourt, an industrial, commercial, cosmopolitan city, and capital of Rivers State in the oil-rich Niger Delta in the south-south region of Nigeria, which is inhabited mainly by the Ijaws, Ikwerres and Ibos. The hospital is run by a family physician and assisted by other specialists as the need arises. It serves mainly the underserved areas of Port Harcourt such as Marine base, Amadi ama, Ogbunabali, Okuru ama, Abuloma etc. A monthly average of 61 patients is seen and treated.

The plan for the research started with the primary investigators obtaining a written permission (BFH/RES/2024/003) from the management of Bethesda Family Hospital asking for access to their hospital records.

Study Design: This study utilized a retrospective descriptive study design.

***Data collection*:** Medical records of all the patients that were seen at the Bethesda Family Hospital, Port Harcourt, Nigeria over a period of five years (January 2018 to December 2023) were assessed for relevant information on acute urinary retention.

***Inclusion Criteria*:** Patients presenting with AUR.

Exclusion Criteria: Incomplete clinical data.

***Definition of rare causes of AUR*:** Rare causes of acute urinary retention refer to unusual or uncommon conditions that lead to the sudden inability to voluntarily pass urine, excluding the most frequent etiologies like BPH, urethral strictures, or standard pelvic organ prolapse

***Sample Size*:** Records of all patients who presented with acute urinary retention within the study period were retrieved for quantitative analysis.

***Statistical Analysis*:** The information obtained from the medical records were transferred into Microsoft excel spread sheet for analysis which was done using Statistical Package for Social Sciences (SPSS) version 21 and Microsoft Excel. The prevalence of acute urinary retention and median age were calculated. Other results were expressed in percentages.

Results

Over a 5-year (January 2018 to December 2023) review period, a total of 3725 patients' records were seen out of which 73 were deficient of the required information. Hence 3652 folders were reviewed. A total of 53(1.45%) patients with acute urinary retention of which two

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(3.77%) were females and 51(96.22%) were males out of which one (1.96%) was an infant. The age distribution of the patients seen in the clinic ranged from 9days to 79 years with a median age of 66 years. Most of the patients were in the 60 to 9 years age bracket. The following are the case reports of the patients with rare cases of acute urinary retention. Rare causes of urinary retention in the hospital clinic were found in four (7.54%) of the patients

Variable	(N)	%
Gender		
Male	51	96.2
Female	2	3.8
Age (Years)		
<50	2	4
50 -59	2	4
60- 69	43	80
70 - 79	3	6
> 80	3	6
Marital Status		
Single	1	2
Married	35	66
Widow	1	2
Widower	16	30
Occupation		
Retiree	22	41
Civil servant	3	6
Self employed	19	36
Business	7	13
Unemployed	2	4

Table1: Socio-demographic characteristics of respondents

Two (3.77%) respondents only were females. More (80%) respondents were aged 60-69years. Most respondents were married (66%) and retired (41%).

Table 2: Causes of AUR

Causes of AUR	Freq	%
Common prostatic enlargement	45	85.00
Stricture	4	7.50
Rare iatrogenic	1	1.87
Bladder stone	1	1.87
Chronic constipation	1	1.87
Uterine fibroid	1	1.87

Rare causes of urinary retention in the hospital clinic were found in four (7.54%) respondents.

Case 1

Chronic constipation as a cause of AUR

An 82-year-old woman reported to the hospital complaining of lower abdominal pain, inability to pass urine and stool of about 5 hours and 7 days duration respectively. She had about two months earlier presented with 5 days history of inability to pass stool which had to be evacuated manually and placed on high vegetable diet and liquid paraffin. She did not adhere to the prescription but was rather taking a herbal preparation which was given by a traditional healer. She was a hypertensive patient on amlodipine 10mg daily which controlled her blood pressure. On examination, she was frail looking and was brought into the hospital on a wheel chair. The lower abdomen was distended of size compatible with 18 weeks gestation and tender to touch. Rectal examination showed poor anal hygiene and anal canal was filled with hard stool. Diagnoses of urinary retention and chronic constipation were made.

A size 16 foley catheter was passed to relieve the urinary retention and the stool was manually evacuated since she could not push the stool out due to frailty. These relieved her pain. She was placed on dulcolax suppository on alternate days and liquid paraffin 10 ml, three times daily for her constipation. The care giver was advised to add a lot of vegetable to her plantain porridge to improve the roughage content of her meal and give her a lot of water to drink to ease constipation. She was asked to stop taking the herbal preparation. She did not present again with urinary retention but constipation was still recurring to a milder degree for which she was managed appropriately.

Case 2

Uterine fibroids as a cause of AUR

A 46-year-old lady was rushed into the clinic on account of inability to urinate of 8 hours duration. She was an actively working lady and had not been on any prescribed medication except a herbal preparation she was taking to dissolve uterine fibroid diagnosed earlier. This was due to lack of financial support. On examination, she was in painful distress with a BP of 130/80mmHg. Abdominal examination showed a cystic lower abdominal mass of size compatible with 18 weeks gestation which was tender to touch. A diagnosis of urinary retention was made and she was catheterised with a size 16 foley catheter. About 550 ml of urine was evacuated and she was sent for a pelvic ultrasound scan. The report came as grossly bulky, anteverted and non-gravid uterus with heterogenous myometrial echopattern due to two echopenic masses. Mass 1 (108mmx80mm) submucous masses located in the

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posterior myometrium. Mass 2(74mmx64mm) subserous mass located in the Antero fundal wall". A diagnosis of uterine fibroid was made and she was counselled on the modality of management. She saw the futility of conservative management with herbs and opted for myomectomy and she was booked for surgery. During surgery, the posteriorly located fibroid was trapped in the pelvis below the sacral promontory. This was brought out with difficulty and myomectomy done. The anteriorly located fibroid was removed. Her recovery was uneventful and she was discharged after five days of admission. There was no more report of urinary retention during her follow up visits.

Figure. 1: Uterine fibroids causing urinary retention

Case 3
Circumcision as a cause of AUR

A nine-day old term male neonate weighing 3.5 kg delivered via spontaneous vaginal delivery by a primipara was brought to the hospital on account of excessive crying, fever, abdominal distension, inability to suck and not passing urine freely of about 10 hours duration. These symptoms started shortly after he had open circumcision using the dorsal slit method which was performed by a local nurse assistant. He was taken back to the nurse who gave him acetaminophen syrup and brought him to the hospital in the company of the parents.

On examination, he was acutely ill-looking, restless, febrile to touch (37.8oC), anicteric, not pale and acyanosed. His chest was clinically clear. His heart rate was 132 beats per minute without a cardiac murmur. There was abdominal distension mainly in the suprapubic region which was also hyperaemic.

Figure 2: Abdominal distension with hyperaemia at the lower abdomen

Examination of the penis revealed a circumcision wound with chromic catgut sutures inserted at the frenulum obviously obstructing the urethra. A diagnosis of acute urinary retention secondary to open circumcision was made. The sutures were removed and he started passing drops of urine, though the bladder was distended. Considering the possible trauma to the urethra, a size 5 feeding tube was inserted into the urethra to drain the bladder and about 250 ml of urine was drained. He was commenced on intravenous ceftriaxone and acetaminophen and referred to a urologist for further care.

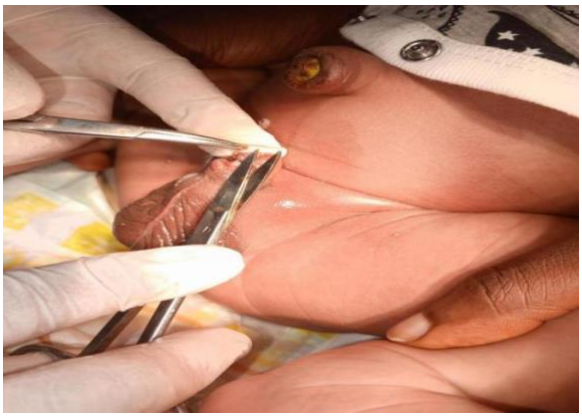

Fig. 3: Removal of the stitches which ligated the urethra

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Fig. 4: Defect under the glans after suture removal

Fig. 5: Bladder drainage with size 5 feeding tube

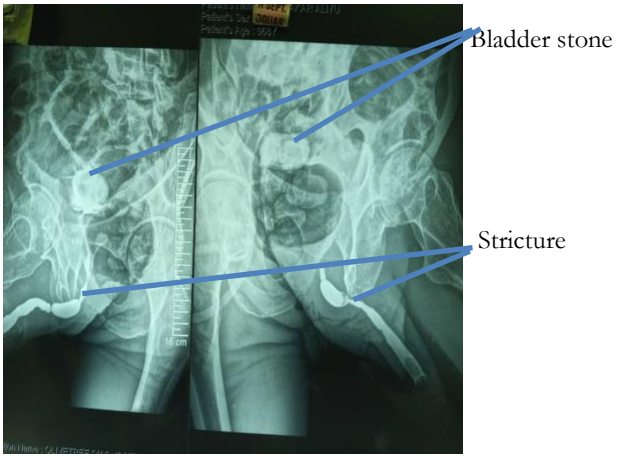

Fig 6: Retrograde urethrogram

Case 4
Prolonged urethral catheterization

A 65-year-old man who presented with inability to defecate and pass urine of five days and 12 hours duration respectively. He had taken fruits and liquid paraffin as prescribed by a doctor to relieve the constipation to no avail but discovered that he could no longer pass urine. He was involved in a road traffic accident about six years prior during which he sustained an injury to the back and could not move the lower limbs and was incontinent of urine and faeces. He was admitted in the teaching hospital and was on urethral catheterisation for about six months. He underwent regular physiotherapy and bladder training before he could walk with support and regain continence.

On examination, he was in painful distress, sweating profusely and a blood pressure of 170/100 mmHg. The lower abdomen was distended to 16/52 size and tender to touch. Digital rectal examination showed a rectum filled with hard stool. Initial diagnoses of urinary retention secondary to chronic constipation and hypertension were made. Tablet nifedipine 30 mg stat was given to him and an attempt to pass a size 16 Foley urethral catheter failed. A suprapubic cystostomy was done in which 750 mls of urine was drained from the bladder. He was still in painful distress as a result of faecal impaction which was disimpacted manually. Examination of the prostate showed a normal sized prostate with smooth surface. Prostate scan was requested for and the report came as:" Prostate gland is top normal and measures about L=4.27 cm, H=2.89 cm, W=4.73cm, volume of 30.44 cm3 = 30g (Reference value ≤ 30g). Capsule outline is continuous. Zones show no features of CaP. Retrograde urethrogram showed

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penile-bulbous and bulbo-membrainous strictures and bladder stone."
The final diagnoses were: Acute urinary retention secondary to chronic constipation, urethral stricture and bladder stone. He was referred to the urologist for further management.

Discussion

Acute urinary retention (AUR) is a urological emergency characterized by the sudden inability to urinate.[9] It is associated with significant anxiety, discomfort and patient inconvenience. The impact on patients' health-related quality of life is comparable to an attack of renal colic.[10] Although common causes like benign prostatic hyperplasia, urethral strictures, infections and inflammatory causes are well-documented,[10] rare causes such as neurogenic disorders, malignancies, iatrogenic and anatomical abnormalities do occur, each presenting unique diagnostic and therapeutic challenges.[10] These challenges are more in resource poor or rural settings due to limited access to advanced diagnostic tools and technologies.[11] Additionally, there is often a lack of specialized medical knowledge and expertise in such settings, hindering the diagnosis of complex conditions that require specialized evaluations.[12] Furthermore, financial constraints and limited funding for rural healthcare facilities contribute to the inadequate availability of necessary diagnostic resources.[13] These limitations collectively create significant barriers to effective and timely diagnosis in rural medical practice and force practitioners to rely heavily on clinical judgment and basic diagnostic methods which delays accurate diagnosis and appropriate treatment.[14,15]

Over the 5-year review period acute urinary retention (AUR) was identified in 53 patients (1.45%) of the total cohort. The gender distribution of AUR showed a marked male predominance, with 51 cases (1.40%) occurring in males and only two cases (3.77%) in females. Notably, one of the male cases (96.22%) was an infant, highlighting a rare pediatric occurrence. Rare causes of AUR were documented in four patients, representing 0.11% of the cohort reviewed. The age range of patients presenting at the clinic varied widely from as young as 9 days to 79 years, with a median age of 58 years. The majority of patients fell within the 55 to 64 years age group. This suggests a trend toward higher incidence of presentations in older adults, consistent with the known epidemiology of AUR in clinical practice.

This discussion highlights rare causes of AUR, including chronic constipation, uterine fibroids, open circumcision and prolonged urethral catheterization resulting in bladder stone.

Chronic constipation

Chronic constipation is a common and often distressing condition among elderly people, greatly affecting their quality of life. This condition is marked by infrequent bowel movements, difficulty in passing stools, or a persistent feeling of incomplete evacuation that lasts for several weeks or more.[16] It is especially prevalent in the elderly due to a mix of age-related physiological changes, comorbid conditions, and the use of various medications.[17] Chronic constipation is not only a source of discomfort but also associated with serious complications, such as fecal impaction, hemorrhoids, and rectal prolapse.[16] The association of chronic constipation and acute urinary retention is rare and can be attributed to the anatomical closeness of the bladder and rectum, as well as their shared innervation S2–S4 which regulate the motor function of the external anal and urinary sphincters.[18] It may also be explained by the impacts of a chronically dilated rectum, irritation of the vesical trigone, invagination of the bladder's posterior wall, and urethral obstruction.[19] Chronic constipation may also cause involuntary contractions of the pelvic floor muscles and the external anal sphincter, hindering bladder emptying.[18]

A case of chronic constipation as a cause of AUR in a 29-year-old female was reported by Smith and Black burn.[20] Management of chronic constipation with acute urinary retention requires a comprehensive and multifaceted approach. Since both conditions were distressing, passing a urethral catheter to decompress the bladder was easier and first addressed before the management of chronic constipation which involves lifestyle changes, such as increasing dietary fiber intake, ensuring adequate hydration, and engaging in regular physical activity.[21] Pharmacological interventions, such as using laxatives and prokinetic agents for constipation are occasionally employed,[22] but considering the acute nature of her presentation, digital disimpaction of the hard faecal matter was done with good effect.

Uterine Fibroid

Uterine fibroids, also referred to as leiomyomas, are the most common benign pelvic tumors in women, affecting

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20-30% of those in their reproductive years.[23,24] While most women remain symptom free, only 25% experience symptoms.[25] These symptoms are linked to the size, location, number, and degenerative changes within the tumor and may include abdominal mass, menorrhagia, dysmenorrhea, pain, recurrent abortions, constipation, and tenesmus.[26]
Acute urinary retention in women should raise the suspicion of uterine fibroids, which warrant both urgent symptomatic management as well as careful long-term planning.

Several mechanisms have been suggested for how uterine fibroid can cause acute urinary retention. The most common theory suggests that compression of the proximal urethra and bladder neck results from anterior and superior displacement of the cervix due to the impacted fibroid. Normally, during voiding, the cervix rotates away from the urethra and bladder neck, but this movement is obstructed by the impacted fibroid.[27] Another theory proposes direct compression of the lower bladder due to anterior and superior displacement of the cervix, potentially causing inadequate urine drainage while in a supine position.[28] In most cases, rather than size, the impaction or incarceration of a leiomyoma or uterus in the hollow of the sacrum is crucial for the development of acute urinary retention.[28] This impaction was what was found in the patient presented. Large uterine fibroids often do not cause acute retention as they expand out of the sacral promontory without becoming entrapped.[28]

Initial diagnosis in rural practice often relies on a detailed patient history and physical examination. Common signs include palpable abdominal masses and irregular uterine enlargement. Clinical vigilance is crucial in rural settings, given the high prevalence of symptoms like menorrhagia and anemia.[29] Ultrasonography remains the primary diagnostic tool due to its accessibility and non-invasive nature. It helps in assessing the size, location, and number of fibroids, crucial for determining the appropriate management strategy.[29] Both transabdominal and transvaginal ultrasounds are recommended, with transvaginal scans being more sensitive for detecting small fibroids.[30] A tailored approach considering the patient's symptoms, age, fertility desires, and access to care is essential for effective management.[31]

Open Circumcision

Circumcision, a common surgical procedure performed on neonates globally, is primarily done for religious, cultural, and sometimes medical reasons.[32] Although generally considered safe and beneficial in preventing urinary tract infections, pyelonephritis, decreased rates of penile cancer, and reduced HIV transmission,[33,34] circumcision can sometimes lead to complications.

The frequency of complications of circumcision were observed in some studies to vary from 0.3% in a study from Nigeria [35] to 12% in South Africa and 17.5% among boys circumcised with a new disposable device (the Shenghuan Disposable Minimally Invasive Device) in China.[36,37] The lowest rates were observed in children under one year old.[38] Although immediate complications are uncommon, they can include excessive bleeding during the procedure, and injuries to the glans or urethra.[39] There have been instances of glans amputation and excessive skin removal, both requiring specialist surgical intervention.[40] The gravity of the complication is dependent on the type of circumcision, the experience of the practitioner and the age of the patient.[37] Urinary retention is a rare but noteworthy complication that can significantly impact the neonate's well-being if not promptly identified and managed.

The most common post-circumcision complication is bleeding.[37] This typically occurs at the frenular artery and usually responds to continuous pressure applied dorsally and ventrally with two fingers. Controlling of such bleeding has been achieved by the application of absorbable sutures to close the incision site, focusing on proper alignment and minimal tension to promote healing.[41] This is rarely performed in neonatal circumcision, whereas it is commonly needed for circumcisions in the post-neonatal period.

In the index case, the neonate exhibited signs of urinary retention within 10 hours post-circumcision. This was confirmed during physical examination in which a distended bladder was found. Although post-circumcision urinary retention can be caused by several factors, including pain-induced reflex inhibition, local edema, and psychological stress.[42,43] The urinary retention in the index case was caused by ligation of the urethra while transfixing of the bleeding frenular artery by the nurse practitioner with chromic catgut sutures. The management of this problem involved removing the

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offending sutures and ensuring proper bladder drainage to prevent further complications This was achieved by releasing the catgut sutures to free the urethra but urinary flow was poor probably due to trauma the urethra and resultant oedema, hence immediate catheterization was done to drain the bladder. Parenteral acetaminophen and ceftriaxone were administered for pain relief and infection control respectively. The referral to the urologist was necessitated by the damage to the urethra. Application of suture to control bleeding in neonatal circumcision should be avoided. If it must be done, it is advisable to avoid transfixing too deeply especially in the frenular area or on the underside of the penis to prevent injury to the urethra. Horizontal mattress sutures are preferable at the frenulum and alignment of the midline skin raphe with the line of the frenulum must be ensured.[44] Other methods of maintaining haemostasias such as use hemostatic clamps to compress blood vessels and reduce bleeding during the incision process[45] and the application of topical hemostatic agents such as thrombin, silver nitrate sticks, or epinephrine to control bleeding from small vessels [46] should be encouraged.

Prolonged urethral catheterization

Prolonged urethral catheterization is a recognized risk factor for the development of urethral strictures and bladder stone. Prolonged catheterization can lead to mechanical trauma, inflammation, and ischemia of the urethral mucosa. This damage can result in scarring and subsequent stricture formation.[47] The incidence of catheter-associated urethral strictures varies, but recent studies suggest it occurs in about 3-5% of patients with long-term catheterization.[48] The risk factors for stricture formation include: duration of catheterization, catheter size and material and improper catheter care or insertion technique.[49] Treatment of catheter-induced strictures may involve urethral dilation, internal urethrotomy and urethroplasty in severe cases.[50] None of these was done in this patient because of the emergent presentation but successful suprapubic cystostomy. The chronic constipation, urethral stricture and bladder stone are independent conditions that can cause urinary retention. Their occurrence at the same time could have been coincidental.

Management and Challenges

In general, management of AUR involves immediate bladder decompression, usually via catheterization, followed by identification and treatment of the underlying cause. In rural settings, challenges include limited access to diagnostic tools such as ultrasound or cystoscopy, and delayed presentation due to geographic and socioeconomic barriers. The non-availability of urethral catheter of appropriate size prompted the use of size 5 feeding tube to decompress the bladder of this neonate. Telemedicine and mobile health units can play a crucial role in bridging these gaps, allowing for timely diagnosis and management.

Conclusion

Acute urinary retention presents unique challenges especially in rural practice due to the diversity of rare causes and limited healthcare resources. Understanding these uncommon etiologies and implementing appropriate diagnostic and management strategies improve patient outcomes. Management of these cases should commence with the immediate decompression of the bladder by any means available followed by the resolution of the causes.

Recommendations

Healthcare providers should be aware of potential complications of some medical problems and have strategies in place for its effective management.

Continuous education and collaboration among rural healthcare providers are essential to enhance the quality of care for patients with AUR.

Improperly trained personnel should not be allowed to perform risky procedures. If they should be allowed especially in rural practice, it should be under strict supervision.

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Limitations

The small sample size limits generalizability because it is likely to be less true representative of the population sine it is not a true random sampling. The retrospective nature of the study may also introduce bias since the study operations, data collected, data entry, and data quality assurance, were not planned ahead of time. The lack of advanced diagnostic tools in the care setting may have led to under-diagnosis of certain conditions.

Declarations

Authors' Contribution: All authors made contributions to various aspects (Conceptualisation, Methodology, Project administration, Writing – original draft, Writing – review & editing etc.) of the research.

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