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Aims & Scope

The Journal aims to publish research in all fields of clinical, diagnostic, experimental & preventive areas related to medical sciences to disseminate scholastic work among clinicians and scientists around the globe.

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Editorial

ENHANCING GERIATRIC CARE IN LOW- AND MIDDLE-INCOME COUNTRIES

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ABSTRACT

Geriatric population is increasing worldwide, thus resulting in rise of healthcare issues. The advancing age has default rise in chronic illnesses, disabilities and mental health issues. Developed countries have improved their health care system by catering the needs of older population. However, low-middle- income countries (LMICs) have not yet addressed this major public health issue. Elderly population living in rural areas has multifaceted problems including lack of social support, financial dependence and insufficient healthcare facilities. Lack of specialized trained healthcare experts in geriatrics is also a major health issue in LMICs. The introducing geriatrics as a sub-specialty, specialized training of lady health workers and lady health visitors, community support groups can solve the issue of growing geriatric population in LMICs.

Key Words: Geriatric healthcare, elderly population, low-middle-income countries

INTRODUCTION

Recently, it has been observed that human life expectancy has improved, resulting in increasing aging population globally. This has brought in a challenge of providing adequate geriatric care, which is increasingly becoming a demand. However, developed countries have come up with geriatrics as a sub-specialty, though in low- and middle-income countries (LMICs), it is still a great challenge. With an estimated 80% of older adults living in these regions, it is crucial to develop strategies that address their unique health care needs and improve their quality of life. This editorial aims to shed light on the special needs of geriatric population in LMICs and the possible approaches needed to enhance geriatric care.

Specific needs for geriatric health care

Advancing age has default rise of chronic illnesses, disabilities and mental health issues. The demographic shift towards an older population in LMICs brings with it a rise in these public health issues. Many older adults in these settings face significant barriers to accessing healthcare due to multiple barriers. A significant proportion of elderly population in LMICs reside in rural areas with limited access to healthcare facilities. Long distances to hospitals and clinics can deter older adults from timely seeking necessary medical care. Healthcare facilities in LMICs often lack the necessary infrastructure, including proper equipments and specialized services tailored for geriatric care, since in most of these countries geriatrics has not yet recognized as a sub-specialty for specialized medical training, therefore, LMICs frequently experience a shortage of healthcare professionals trained in geriatric medicine, this lack of expertise hampers the ability to deliver appropriate care for older patients. This can lead to suboptimal treatment and increased morbidity.

Another important issue with elderly population is the financial dependence, as many elderly individuals in LMICs live on fixed incomes such pension or are dependent on family members in most cases on their children. High out-of-pocket costs for medical care, medications, and transportation can create financial burdens, leading to delayed or

forgone care. The result is a healthcare landscape that often neglects the specific needs of older individuals, leading to inadequate management of chronic conditions and poor health outcomes. In addition, many elderly individuals face social isolation, which can exacerbate physical and mental health issues. Lack of community support and engagement can lead to depression and a decline in overall well-being.

Addressing the Gaps in Geriatric Health Care

In order to effectively address these gaps, we need to properly highlight the issues then prioritize solutions of those factors. Keeping in view of the current scenario the training of healthcare providers in geriatric care appears to be the top priority. Developing specialized training programs that focus on the complexities of aging can equip healthcare workers with the necessary skills to manage the unique health care challenges faced by older adults. Moreover, integrating geriatric care into primary health systems can facilitate early diagnosis and management of age-related conditions, promoting a more proactive approach to healthcare.

Community engagement is another essential component of effective geriatric care in LMICs. Many older adults prefer to age in place surrounded by family and community. Establishing community health programs that provide education, resources, and support can significantly enhance the well-being of older individuals. These programs can include home visits by healthcare workers, support groups, and initiatives that promote physical activity and mental health. Sindh has a rich network of lady health workers and lady health visitors, they can also be trained to provide essential geriatric care in their respective communities.

Recently the rise of digital health technologies offering promising avenues for improving geriatric care. Telemedicine can also be expanded to cater the needs of elderly population to improve home care services, particularly in rural areas where medical resources are scarce. Mobile health applications can also facilitate health monitoring, medication adherence, and communication between patients and healthcare providers. By harnessing technology, we can bridge the gap between older adults and the healthcare services they require.

CONCLUSION

As we move forward, it is imperative that we adopt a comprehensive and inclusive approach to geriatric care in LIMCs. By investing in higher education and specialized training of healthcare workers, community engagements, utilization of technology we can create a healthcare system that values and supports its aging population. By prioritizing the needs of older adults, we not only enhance their health and well-being but also enrich our societies as a whole. Also by providing overall well-being facilities upcoming major health issue of geriatric health problems can be addressed.

Research article

GONIOSCOPY VERSUS ANTERIOR SEGMENT OCULAR COHERENCE TOMOGRAPHY FOR ANTERIOR CHAMBER ANGLE ASSESSMENT. A COMPARATIVE STUDY.

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ABSTRACT

This study was conducted to determine the anterior chamber angle to improve the diagnostic accuracy, treatment modalities and health outcomes in individuals with angle-closure glaucoma. This was a comparative cross-sectional study at the Institute of Ophthalmology Liaquat University of Medical and Health Sciences, Jamshoro, Sindh, Pakistan. Patients with various ocular conditions presented at Glaucoma clinic, aged 20 years old or above of either gender were included. After obtaining written informed consent, the gonioscopy and anterior segment optical coherence tomography (AS-OCT) imaging was done in all participants. A trained ophthalmology resident presented the Questionnaire in the local language, while a consultant ophthalmologist performed the complete general ocular evaluation, slit-lamp examination, gonioscopy and anterior segment optical coherence tomography. Out of 178 participants, 146 (82%) patients were male patients, and 32 (18%) were females. The majority of patients, 79 (44.4%), were aged between 41 to 50 years, while 51 (28.7%) were over 60 years old. AS-OCT has shown to enhance health outcomes, diagnostic accuracy, and treatment modalities compared to gonioscopy in patients with angle-closure glaucoma. The findings from anterior segment OCT were significant ($p < 0.001$) in comparison to gonioscopy. In conclusion this study revealed that both gonioscopy and AS-OCT imaging identified the upper quadrant as having the highest prevalence of angle closure. However, the relative incidence of closed angles in the other quadrants varied depending on the modality utilized. Some of these variations may be explained by specifics in how each technique's ACA configuration is assessed and interpreted.

Key words: Anterior Chamber, Anterior segment OCT, Glaucoma.

INTRODUCTION

Glaucoma is a type of eye illnesses that induce harm to the optic nerve, which indeed is necessary for vision(1). Exceptionally high ocular pressure is usually the cause of this damage. Glaucoma is one of the most frequent causes of irreversible blindness in individuals over the age of 60(2). The trabecular meshwork provides greater resistance to fluid outflow in open-angle glaucoma. As a result, the intraocular pressure rises and damage the optic nerve(3). The anterior chamber angle (ACA) must be measured in order to identify individuals with angle closure and correctly classify glaucoma(4). The cornea, anterior chamber aspect, aqueous discharge route, conjunctiva, and ocular surface properties are all evaluated using anterior segment optical coherence tomography, which has emerged as one of the non-contact imaging paradigms' cornerstones(5). As a result, it has a wide range of therapeutic uses, all of which have been independently described in the literature5. The anterior chamber angle of an eye must be evaluated in order to appropriately diagnose individuals with closed angles(6). Although gonioscopy is the current gold standard for determining anterior chamber inclination, its disadvantages, such as its subjectivity, the requirement for training, and high variability among the clinicians, have prompted research in alternative assessment

techniques(7). Based on gonioscopy, it is acknowledged that Most eyes' ACAs differ anatomically, with the superior quarter becoming the shortest, the inferior quarter has always been the widest, and the temporal and nasal regions being somewhere in the middle(8).
The upper quadrant of the angle is the narrowest, according to AS-OCT research defining the anatomic variance of the ACA(9). On AS-OCT, the temporal and nasal quadrants are often broader than the inferior quadrant. On multi-image AS-OCT, there is also a significant anatomic diversity of the ACA(10).

The AS-OCT, on the contrary side, provides a quick, noncontact means of assessing angles that may be both subjective and quantitative(11). Its technical specialists have been extensively detailed, and angle evaluation with AS-OCT has been found to somewhat correspond with gonioscopy(12).

The van Herick test, which determines which patients should have gonioscopy based on the ratio of the periphery anterior chamber width to the outer corneal thickness is frequently used to decide whether individuals should receive gonioscopy(13). The main issue with this method is that it lacks sufficient sensitivity and specificity to detect all individuals with angle closure(13). In one study, the gonioscopy was compared to the van Herick test, which were carried out by specialists, trainees, and medical students, The van Herick test has a sensitivity of just 58 to 79 percent for detecting angle closure(14).

Gonioscopy, a short examination that requires contact with the cornea and is frequently regarded as tiring in a busy clinical practice, is the existing reference standard for assessing the ACA configuration(15). Moreover, gonioscopic findings may be altered even during inspection by accidental tension on the gonioscopy lens and intensity of light. Previous study has demonstrated that even professional, trained examiners had only a small level of consensus when calculating angle width(16). Due to existing controversies in the literature regarding the utility of AS-OCT, together with recommendations for further studies to elucidate its efficacy (17), and the lack of sufficient local literature, this study was conducted, to compare the accuracy of both procedures, gonioscopy and AS-OCT in diagnosing angle closure in patients seeking ocular therapy at a general hospital. Additionally, the study aimed to assess any disparities in results between the two procedures across successive levels of the anterior chamber angle (ACA).

METHOD

A comparative cross-sectional study was conducted at Institute of Ophthalmology Liaquat University of Medical and Health Sciences, Jamshoro, Sindh, Pakistan. Study was conducted for 1-year from 5/4/2021to 4/4/2022. A non-probability convenient sampling technique was used. Ethical approval was obtained from the Ethical Review Committee of LUMHS Jamshoro. Sample size calculation was done by Epi-Info™ version 7.2. Using a 3.4% prevalence of blindness in Pakistan (9), applying a margin of error of 5% and 95% confidence interval [CI]), a sample size of 178 was estimated. All the patients with narrow angle, aged 20 years old or above and both genders were included. Patients with history of previous intraocular surgery or a traumatic eye injury, individuals with corneal abnormalities such as corneal endothelial degeneration, pterygium, or corneal scarring that may limit adequate imaging, as well as those using drugs that affect the pupil and patients who have already undergone laser radial iridotomy were excluded.

After obtaining written informed consent and explanation of the study aims and objectives, all the participants underwent gonioscopy and anterior segment optical coherence tomography imaging. A trained

ophthalmology resident presented the Questionnaire in the local language, while consultant ophthalmologist performed the complete general ocular evaluation and slit-lamp examination.

The Gonioscopy was done in all selected patients to determine the grades and later on anterior segment OCT was done on same patient and the grade of the angle was determined. The examiner was an experienced ophthalmologist with substantial gonioscopy expertise in a research context. The light beam was shortened to I-mm beam to fit through a small slit, and the vertical beams were offset horizontally for both vertical positions i-e superior and inferior orientations, while vertical beam for horizontal positions to assess the angles nasally and temporally. The Gonioscopy performed both static and dynamic at a high amplification (×16) with the eye in the regular position of gazing, correspondingly, using a Goldman 3-mirror lens. During the examination, precautions were made to avoid the falling of light on the pupil and unintentional indentation. Some angling of the Gonio-lens was done to provide a view across the contour of the iris. According to the anatomic features identified during gonioscopy, the Scheie grading technique was used to classify the ACA in each quadrant.

The Swept source (Topcon) OCT machine was used for AS-OCT. Three consecutive images of ACA in each eye were acquired under dim environment. The surgeon gently lowers the lower eyelid to photograph the lower angle, and gently raised the upper eyelid while imaging the upper angle to avoid the interfere the eyelids while imaging angle at 6 o'clock and at 12 o'clock. OCT image data was transferred to a personal computer and analyzed for the being assess the anterior chamber angle whether open or closed.
On a gonioscopy, the ACA was supposed to narrow angle or closed if without indentation the posterior part of trabecular meshwork was not detectable in the dominant position. On AS-OCT imaging, a quadrant was considered closed if angle wall was present anterior to the scleral spur and in contact with peripheral iris.

Statistical Methods

The data was collected and analyzed by using Statistical Package for Social Sciences (SPSS version 22.0, IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp) Frequency, proportions, and percentages were employed to describe categorical data, and the Pearson chi - square test was performed to examine the relationship. The mean and standard deviation for continuous variables were given, and any differences were determined using a t-test. The statistical significance value was determined using a p-value of 0.05.

RESULT

Out of 178 patients, the majority fell within the 41 to 50 age group, constituting 44.4%, followed by those over 60 years old, comprising 28.7% of the study population. Conversely, the 31 to 40 and 51to 60 years age groups represented 7.3% and 19.7% of the patients, respectively. In terms of gender, males accounted for a significant majority at 82%, while females were 18%. Regarding residential status, a slightly higher percentage of patients hailed from urban areas (56.7%) compared to rural areas (43.3%). Occupational diversity was evident, with technicians comprising the largest proportion at 24.7%, followed by retired individuals at 28.7%. Other occupations included housewives (18.0%), drivers (10.7%), mechanics (9.0%), and shopkeepers (9.0%) as shown in **Table 1.**

In the gonioscopy findings, Grade 3 accounted for 32.0% of individuals, while Grade 4 was not found. Conversely, AS-OCT revealed Grade 4 findings in a significant majority, constituting 68% of cases, with no instances of Grade 3 observed. Statistical analysis revealed a highly significant difference ($p < 0.001$) between

the two modalities. This comparison underscores the superior sensitivity of AS-OCT in detecting Grade 4 angles compared to gonioscopy. **Table 2**. The number of quadrants with closed ACA detected on gonioscopy and OCT images of the anterior segment of the four quadrants of 356 eyes is shown in **Table 3.**

Table. 1. Bassline characteristics of the patients (n=178)

Variables		Frequency	Percentage
Age groups	31-40 years	13	(7.3%)
	41-50 years	79	(44.4%)
	51-60 years	35	(19.7%)
	>60 years	51	(28.7%)
Gender	Male	146	(82%)
	Female	32	(18%)
Residential status	Rural	77	(43.3%)
	Urban	101	(56.7%)
Occupational	Driver	19	(10.7%)
	Housewives	32	(18.0%)
	Technician	44	(24.7%)
	Mechanics	16	(9.0%)
	Retired peoples	51	(28.7%)
	Shopkeepers	16	(9.0%)

Table 2. AS-OCT findings versus Gonioscopy findings n=178

Gonioscopy findings (Shaffer's grading)	*AS-OCT findings*		*P value*
	Grade 3	**Grade 4**	
Grade 3	57 (32.00%)	0 (0.00%)	**<0.001***
Grade 4	0 (0.00%)	121 (68.00%)	

Table.3 The number of quadrants with closed ACA detected on gonioscopy and OCT images of the anterior segment of the four quadrants of 356 eyes.

Quadrants	*No. Closed on AS-OCT (%, 95% Confidence Interval)*	*No. Closed on Gonioscopy (%, 95% Confidence Interval)*	*P Value**
Superior	149 (47, 43-52)	150 (30, 26-34)	0.05
Inferior	126 (44, 40-49)	95 (21, 17-25)	0.002
Nasal	56 (17, 14-21)	51 (15, 12-19)	0.12
Temporal	25 (13, 10-16)	60 (19, 15-23)	<0.001
Total	356 (31, 29-34)	356 (20, 18-22)	0.04

DISCUSSION

Glaucoma stands as a prevalent cause of blindness among individuals aged 60 and above. Detecting and averting angle closure early could halt the advancement to blindness in around 70% of instances (18,19). Investigators can get comprehensive cross-sectional pictures of the ACA using anterior segment OCT equipment without contact with the globe. These photos can be qualitatively analyzed therefore, the operation is quick and painless for the patient. It is also possible that there is less distortion of angle morphology as a result of the lack of globe modification. When gonioscopy is used as a reference standard, AS-OCT has a sensitivity of 98%. In low light situations, moreover, AS-OCT revealed visual contact between the iris and the anterior structures to the scleral spur in several eyes where gonioscopy showed open angles.

Most eyes with angle closure identified by AS-OCT had a Spaeth gonioscopy grade of 0° to 20°. However, when evaluated by quadrant, a limited proportion of instances with gonioscopy angle widths of 20° are closed on AS-OCT pictures. In aligns to this study Kunimatsu et al (20)
examined the anterior chamber angle of 80 individuals with shallow anterior chambers in periphery, using ultrasonic bio microscopy (UBM) and discovered that the superiorly had the greatest percentage of closed angles (79%), followed by the inferiorly (64%), nasally (33%), and temporally (33%). Consistently Desmond T et al (17) concluded that AS-OCT exhibits promising sensitivity in detecting angle closure, potentially offering a solution to the prevalent issue of undiagnosed angle closure, particularly prevalent in developing Asian nations. Nonetheless, AS-OCT has not reached the point where it can supplant gonioscopy. Hence, clinicians must assess whether the diagnostic precision of AS-OCT aligns with their specific clinical requirements before incorporating it into practice. In the comparison of this study Esporcatte BL et al (18) also observed that the AS-OCT outperformed gonioscopy in detecting angle closure among patients with a shallow anterior chamber. In the present investigation, the AS OCT was employed to corroborate these results. The superior quadrant has the most closed ACAs, with the lower quadrant close behind. In eyes with just one or two closed ACA quadrants, the superior and inferior quadrants if these quadrants were not scanned, there was a probability of overlooking of angle closure in several eyes.

Generally, the concordance among AS OCT and gonioscopy in detecting a sealed ACA quadrant was excellent as in a prior study (9), the consistency was fair as compared to gonioscopy, AS OCT revealed more enclosed ACAs. When the two systems contrasted, the OCT preferred to see temporal aspects as open when they seemed sealed gonioscopically. The differences in outcomes between AS OCT and gonioscopy in various four directions might be due to technological difficulties in carrying out each operation. Viewing the temporal angles, for example, may be tough. According to Nolan et al (9), the distinction between the two methods may be accounted in part-gonioscopy may artificially open the ACA due to inadvertent indentation and excessive light. The difference in findings among gonioscopy and AS OCT might have been attributed, compared to 26% of quadrants defined as closed by both procedures. Angular closure has been considered to be an arbitrary connection between the iris and the angular wall proximally to the scleral spine, but this short iris angular interaction in AS OCT is considered angular closure. On gonioscopy, it is possible that the quadrant was not recorded as atresia because the gonioscopist judged ACA only by viewing the majority of the posterior glomerulus through the quadrant. In this study using Swept Source OCT, the manifestation of steep, supposed to be over-hill iris configurations was subjectively detected in 51% of cases. The ACA is considered closed by gonioscopy, but is considered open by Swept Source OCT. In such cases, it is possible that critical measurements of the iris interfered with the unfiltered view of angular structures using the gonioscopy lens, resulting in a closed ACA impression as observed with gonioscopy. There seems to be Another possibility is that the edge of the gonioscope was unexpectedly compressed when attempting to view the iris contour, causing unwanted mechanical deformation of the cornea and shaping the anterior chamber angle look artificially narrow(10,21). In such cases, either the gonioscopist detected an angle open regardless of a steep iris contour, or the ACA was artificially opened by light or accidental squeeze during gonioscopy.

However AS-OCT assessment of ACA in each quadrant is grounded solely on angular cross-sectioned images, and it is possible that there were anomalies in quadrants missing in that image. This study showed that many ACA images taken by AS OCT can be assessed, especially when performed by untrained personnel or assessed by independent viewers. There may be a large number of imageries in the clinical setting where

ACA status cannot be concluded without practical knowledge and experience. A particular attention paid may cause systematic bias in gonioscopy data, which is considered as a limitation of the study.

CONCLUSION

This study revealed that both methods of anterior chamber angle assessment i-e gonioscopy and AS-OCT imaging identified the superior quadrant as having the excessive prevalence of closed angles. However, the relative incidence of closed angles in the other quadrants varied depending on the modality employed. These discrepancies
may stem from differences in how each technique assesses and interprets the anterior chamber angle (ACA) configuration. The clinical significance of findings of AS-OCT in managing patients with angle closure warrants further investigation through long-term prospective trials. As this study represents a novel endeavor at the local level, similar investigations should be conducted in every teaching hospital with ophthalmic services and access to anterior segment OCT. The accumulation of additional data from such studies would enhance the sensitivity and specificity of our findings, ultimately benefiting patients on a larger scale.

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Conflict of Interest:

Authors declared no conflict of interest.

Ethical Approval: The study was approved by the Institutional review board/Ethical review board **(LUMHS/REC/-62).**

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Research Article

SUSCEPTIBILITY PATTERN OF CEFTAZIDIME-AVIBACTAM AGAINST MULTI DRUG RESISTANT GRAM-NEGATIVE ROD

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ABSTRACT:

This study was conducted to evaluate the susceptibility pattern of ceftazidime avibactam against multi drug resistant gram negative rods. This prospective study cross sectional study conducted in Microbiology Section of Dow Diagnostic Reference and Research Laboratory, Dow University of Health Sciences, Karachi, Pakistan. Identification of isolates was done in accordance with the standard bacteriological technique, and were distinguished based on gram staining, colony morphology and biochemical tests. Antibiotic susceptibility testing (AST) was performed on Muller-Hinton agar by Kirby-Bauer Disk Diffusion method in accordance with the Clinical Laboratory Standard Institute (CLSI) guidelines. Good sensitivity of Lactose fermenters (*Escherichia coli*, *Klebsiella pneumoniae* and *Enterobacter*) were observed against Ceftazidime avibactam. *Pseudomonas aeruginosa* exhibited 42% resistance in all clinical samples. *Proteus species* and *Serratia* have shown high resistance in our study. Our observations showed the persistence of high ceftazidime avibactam activity against pathogenic and multi drug resistant strains of Enterobacterales and Non lactose fermenting bacteria.

Keywords: Ceftazidime-avibactam, Multi drug resistant organisms (MDROs), Enterobacterales, Pseudomonas aeruginosa

INTRODUCTION

Multi drug resistant organisms are those in which there is a development of resistance to minimum two or more classes of antimicrobial drugs (1). Numerous elements contribute in the emergence of drug resistance such as frequent use of antimicrobials for minor infections and the lack of new antibiotics development (2). These multi-drug resistant bacteria considerably increase the mortality, morbidity and length of hospital stay which also increases the cost of treatment and pose unnecessary burden on healthcare system. Gram negative rods infections are one of the major causes of nosocomial infections. These organisms are more prone to develop resistance by up regulating and acquiring genes of resistance (3). Various mechanisms involve in the development of antimicrobial resistance in gram negative rods as they produce drug inactivating enzymes, reorganization of the drug targets, accession of target by pass mechanism, decreased cell permeability and quick elimination of the drugs from cell (4). Production of extended spectrum βlactamase enzymes and carbapenemase enzymes are among the most common drug resistance mechanisms. Carbapenem resistant Enterobacterales, multi-drug resistant Pseudomonas aeruginosa are the ultimate threat for humans and amongst the most prevalent organisms that cause nosocomial infection (5). There is a need of new antibiotics for the treatment of these multi-drug resistant organisms. One of the most wide-ranging antibiotics which demonstrate activity against multi drug resistant antibiotics is Ceftazidime-avibactam. Ceftazidime is the third generation, broad spectrum cephalosporin combines with the β-lacatamase inhibitor avibactum. Avibactam efficiently inhibit sclass A β-lactamases as well as TEM, SME, PER, CTX-M, KPC, SHV, GES, chromosomal class C that is Amp C, plasmid class C like FOX,DHA, MOX, CMY, LAT, ACC, class D including OXA-48 from Klebsiella pneumoniae and OXA-24, OXA-40 and OXA-69 from

Acinetobactor baumanni (6). Ceftazidime-avibactam is broad spectrum showing extensive activity against Enterobacteriaceae, Pseudomonas aeruginosa and also used for empirical treatment of nosocomial infections (7). Emergence of resistance against Ceftazidime avibactam were also reported in many cases against gram negative rods (8-10). The goal of our study is to evaluate the efficacy of ceftazidime avibactam against pathogens in different specimens which will help physicians in designing of empirical treatment against gram negative rods.

MATERIAL AND METHODS

This prospective study with a cross sectional design was conducted in Microbiology section of Dow Diagnostic Reference and Research Laboratory, Dow University of Health Sciences, Karachi, Pakistan. Samples including urine, pus, blood, sputum, tracheal aspirate, sterile body fluids received from all patients regardless of their age and gender. Written approval was taken from the institutional review board with reference no IRB-2649/DUHS/Approval/2022/1024.All cultures were performed in Department of Microbiology, DDRRL, DUHS, according to the protocols of Clinical Laboratory Standard Institute (CLSI).

Identification of isolates was done in accordance with the standard bacteriological techniques, and were distinguished based on gram staining, colony morphology and biochemical tests, such as oxidase, urease, citrate, indole, triple sugar iron tests for gram-negative isolates (11). Analytical Profile Index-20E (API20E) was further used to distinguish gram-negative rods (GNRs). Antibiotic susceptibility testing (AST) was performed on Muller-Hinton agar by Kirby-Bauer Disk Diffusion method in accordance with the CLSI guidelines (12). For gram-negative bacteria, Ampicillin (AMP) (10µg), Ciprofloxacin (5µg), Ceftriaxone (CRO) (30µg), Ceftazidime (CAZ) (30µg), Gentamicin (10µg), Tobramycin (10µg), Amikacin (30µg), Cotrimexazole (25µg), Azithromycin (AZT), Amoxicillin-clavulanic acid (AMC) (30/10µg), Tazobactum-piperacillin (TZP) (100/10µg), and Meropenem (30µg) were used (11). The susceptibility breakpoints were interpreted according to CLSI guidelines 2022. *Escherichia coli* (ATCC25922), *Staphylococcus aureus* (ATCC25923) and *Pseudomonas aeruginosa* (ATCC27853) were used as quality control strains for culture and susceptibility testing(13).

The susceptibility breakpoints were interpreted according to CLSI guidelines 2022.

Statistical methods

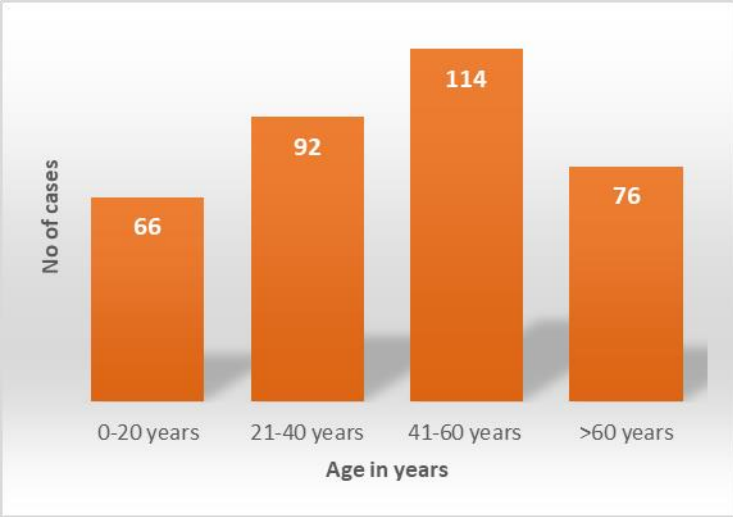
The data was analyzed by using Statistical Package for Social Sciences (SPSS version22.0). Mean was calculated for continuous variables, while frequency and percentages were computed for categorical variables including microorganism, Ceftazidime avibactam susceptibility, gender and specimen type i.e. pus, blood, urine, sputum, tracheal aspirate and sterile body fluids.

RESULTS:

A total of 348 samples of Multi drug resistant gram-negative rods were studied. Among these isolates 186 were males and 162 were females. Mean age was 44.44 years, with the youngest one of 1 day and oldest of 104 years of age. Maximum numbers of multi drug resistant organisms were noticed in the ages of 41 to 60 years (Figure 1). In our study, 186 (53%) of multi drug resistant gram negative rods were isolated from blood followed by urine 136 (39%) while remaining were isolated from pus, tracheal aspirate, sputum, different fluid fluids and tissues (Figure 2).

Escherichia coli was the dominant pathogen followed by Klebsiella pneumonia, Enterobacter and Pseudomonas aeruginosa from clinical specimens. Majority of organisms were resistant to major classes of antibiotics like Beta lactam, Beta lactamase inhibitors, Aminoglycosides, Fluroquinolones, Cotrimoxazole and Colistin. In urine samples these organisms showed resistance against Fosfomycin and Nitrofurantoin. It was observed that these organisms have shown less resistance against Tigecycline and Minocycline. Further analysis of all antibiotic sensitivity pattern including ceftazidime avibactam for different organisms presented in Table 1.

Considerable sensitivity of Lactose fermenters (*Escherichia coli* , *Klebsiella pneumoniae* and *Enterobacter*) were observed against Ceftazidime avibactam. *Pseudomonas aeruginosa* exhibited 42% resistance in all clinical samples. *Proteus species* and *Serratia* has shown high resistance in our study. Further pattern of Ceftazidime avibactam susceptibility against MDROS in different clinical specimens was elaborated in Figure 3.



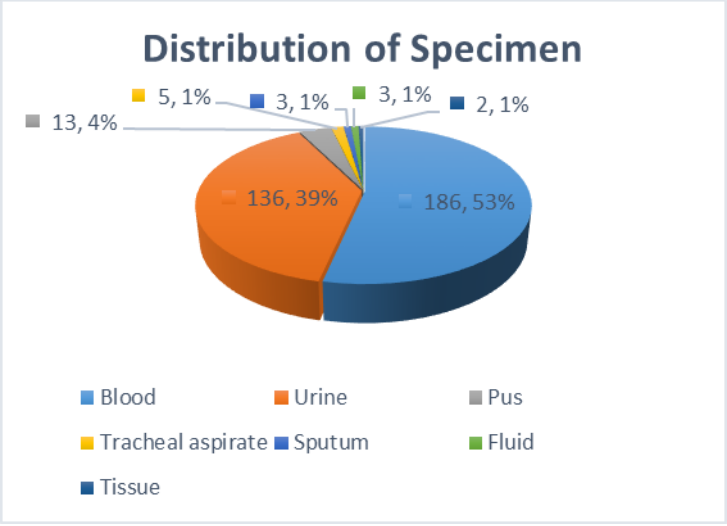


Figure 1. Age-wise distribution of specimen.

Figure 2. Distribution of specimen positive for MDROS

Table 1. Antibiotic resistance pattern of Multi drug resistant gram-negative rods

Org Name n=409 (100%)	AMP	AMC	CRO	CXM	CFM	CAZ	TZP	MEM	CT	CIP	TGC	SXT	MH	AK	CN	TOB	FOS	F	CZA
***Escherichia coli* = 159**																			
BLD=78	78	77	77	77	77	NT	73	64	6	78	2	65	22	56	54	40	NT	NT	22
U=72	60	60	65	68	68		66	60	5	70	0	66	0	37	50	60	62	50	33
P=5	5	5	5	5	5		4	5	0		3	5	0	4	3	4	NT	NT	2
FL=3	3	3	3	3	3		3	3	1	3	0	3	0	3	3	3			0
SPT=1	1	1	1	1	1		1	1	1	1	NT	1	NT	0	0	NT			1
***Klebsiella pneumoniae* = 77**																			
BLD=77	NT	36	44	44	44	NT	39	25	13	29	2	42	18	39	39	39	NT	NT	12
U=22		19	18	21	21		20	21	5	18	0	20	0	13	19	16	NT	17	8
P=5		2	5	5	5		5	5	0	5	1	5	0	3	4	5	NT	NT	1
SPT=1		1	1	1	1		1	1	0	1	NT	1	1	1	1	1			1
TA=3		3	3	3	3		3	3	0	8	0	3	1	3	3	0			2
TSU=2		2	2	2	2		2	2	3	3	0	3	1	2	2	0			0
***Enterobacter spp*=47**																			
BLD=40	NT	NT	40	40	40	NT	31	34	20	36	0	35	20	32	40	31	NT	NT	9
U=3			3	3	3		3	3	0	3	NT	3	NT	3	3	3	NT	3	2
P= 1			1	1	1		0	1	1	1		1		1	0	0	NT	NT	0
SPT=1			1	1	1		1	1	1	1		1	1	1	1	1			0
TA=2			2	2	2		3	2	2	2	0	2	0	2	2	0			0
***Pseudomonas aeruginosa*=45**																			
BLD=9	NT	NT	NT	NT	NT	5	6	5	0	6	NT	NT	NT	NT	NT	6	NT	NT	2
U=34						19	23	18	0	24				19	NT	26	NT	NT	16
P=2						1	2	2	0	2				NT	NT	2	NT	NT	1
***Klebsiella oxytoca* =10**																			
BLD=8	NT	6	8	8	8	NT	5	2	2	4	1	6	2	7	6	NT	NT	NT	1
U=2		2	2	2	2		1	2	0	2	0	2	NT	2	2	2	NT	2	2
***Serratia spp*= 6**																			

BLD=5	NT	NT	5	NT	5	NT	4	5	NT	1	0	1	0	5	5	5	NT	NT	3
U=1			1		1		0	0		1	0	1	NT	1	1	1	NT		0
***Proteus spp* = 5**																			
BLD=3	NT	NT	3	NT	3	NT	3	3	NT	3	NT	3	NT	0	0	0	NT	NT	2
U=2			2		2		1	2		2		2		2	2	2	NT		1

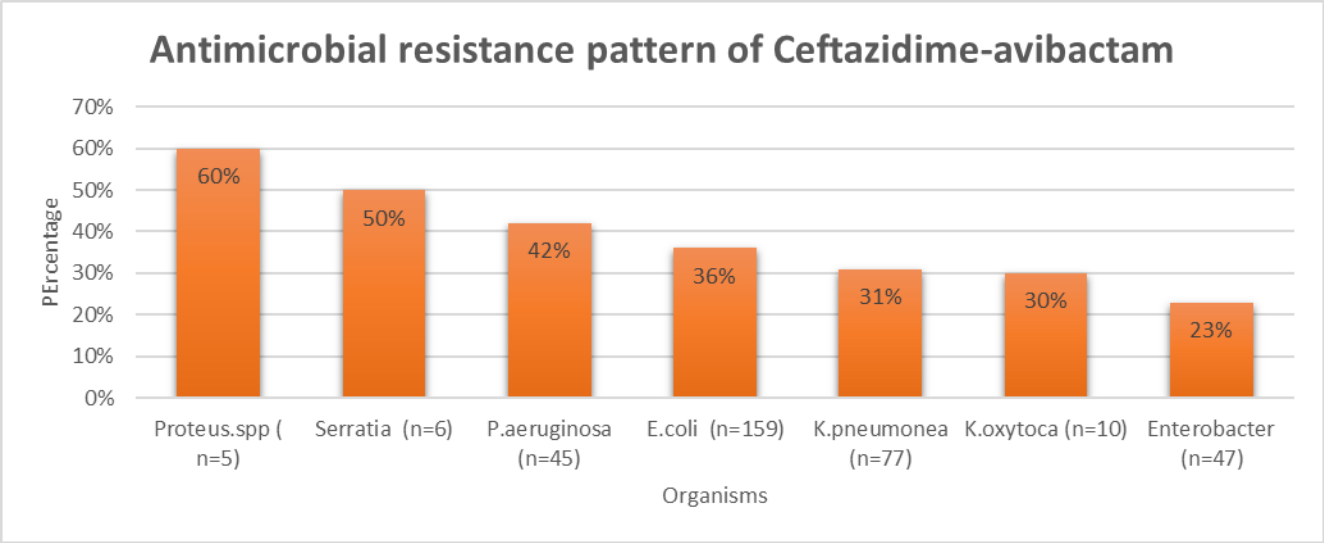


Figure 3 Antimicrobial Sensitivity Pattern of Ceftazidime-avibactam

DISCUSSION:

Infection due to resistant gram-negative bacteria is now emerging as a serious health concern globally, as they post a great challenge to healthcare providers while treating them and result in high rates of morbidity and mortality. Ceftazidime avibactam is approved recently to treat number of community and hospital acquired multi drug resistant organisms. In this study, we report antimicrobial susceptibility rates for ceftazidime avibactam and other commonly used antibiotics to a collection of clinical isolates of *Enterobacterales* and *Pseudomonas aeruginosa*.

In our study majority of patients were males and belonged to 41 to 60 years of age which might imitate variances in prior antimicrobial exposure or gender differences in acquiring healthcare facilities, fluctuate by both geographical and social influences, as well as income and literacy rate, also shown by Amanati A et al (14). Majority of drug resistant bacteria in our analysis were isolated from blood followed by urine, pus, sputum, body fluids and tissue, whereas Mshana, S. E. et al has high number of resistant bacteria from urine, wound swabs and blood (15).

Escherichia coli is the most frequently isolated organisms in all samples, also reported in many studies (11, 16). *Klebsiella pneumoniae, Enterobacter* and *Pseudomonas aeruginosa* were other common isolates which was also observed by Wu, X. et al and Yaseen, M et al (17, 18). We evaluated highest resistance against like Beta lactam, Beta lactam inhibitors, Aminoglycosides, Fluroquinolones, Cotrimoxazole and Polymyxins and in urine nitrofurantoin and Fosfomycin which is consistent with the analysis of Wangai, F. K. et al, Bitew, A. et al and Teklu, D. S. et al (19-21). A recent study stated that 28% of *Proteus mirabilis*, 56% of *Klebsiella pneumoniae*, and 78% of *Escherichia coli* isolates revealed resistance to Fluroquinolones also constant with our findings(21). In our study, Meropenem and Colistin showed resistance and susceptibility against *Pseudomonas aeruginosa*. In contrast, according to Prakash & Saxena, sparfloxacin and meropenem are the most resistant and susceptible drugs, respectively, in *Pseudomonas aeruginosa*(22). Our study shown reduce resistance against Tigecycline which is also observed in other studies also (23).

Our analysis reported high resistance of Ceftazidime avibactam in *Proteus species*, *Serratia spp*, *Pseudomonas aeruginosa* and other *Enterobacterial.* In contrast, Jia P et al showed high susceptibilities of ceftazidime avibactam against *Proteus mirabilis, Serratia marcescens* and *Pseudomonas aeruginosa* (24). Ceftazidime avibactam attained the maximum activity against *E.coli* and *K. pneumoniae* isolates which were among the most abundant organisms about 53% and 42% of MDR in our analysis and the similar trend of high Ceftazidime avibactam susceptibility is maintained in the study by Kristof et al (6).

The study presents compressive data on an important health issue, with a considerable sample size, which is considered as strength of the disease.

CONCLUSION:

The current study grants important information to demonstrate and narrate with further similar studies to specify the current mode of antimicrobial susceptibility of multi drug resistant gram-negative rods and assist in determining the sensitivity pattern of ceftazidime avibactam. Our observations supports the persistence of high ceftazidime avibactam activity against pathogenic strains of *Enterobacterales* and *Pseudomonas aeruginosa*, including those carrying different types of antibiotic resistance.

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Research Article

PREVALENCE OF SENSORINEURAL HEARING LOSS AMONG STROKE PATIENTS

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ABSTRACT

This study was designed to determine the prevalence of sensorineural hearing loss among stroke patients. A cross-sectional analytical study was conducted. Medicine department of HMC Peshawar and lady reading hospital (LRH) in Peshawar. Total 224 diagnosed stroke patients were selected by non-probability purposive sampling technique. 20 and above age group male and female were included. Transient ischemic, psychological, and congenital stroke patients were excluded. Pure Tone audiometry (PTA) was done using pure tone audiometer to identify type of hearing loss. The Study was conducted at audiology Department of The University of Lahore for the duration of six months from 22nd March2023 to 22nd August2023. Out of 224 stroke patients, 168 were ischemic and 56 were hemorrhagic type.15 patients had conductive hearing loss,111 had sensorineural hearing loss,21 had mixed hearing loss while 66 were having normal and 11 were having high frequency sensorineural hearing loss. This study showed that there was no significant association between sensorineural hearing loss and stroke.

Key words: Sensorineural hearing loss, Ischemic stroke, Hemorrhagic stroke.

INTRODUCTION:

Stroke is the predominant neurological disorder and a primary contributor to disability; nearly 66% of stroke survivors depart the hospital with disabilities. Stroke can impact every aspect of the auditory system, from the inner ear to the central auditory pathways, leading to diverse forms of hearing impairment including peripheral hearing loss, disrupted auditory processing, and cortical deafness(1).

Within the stroke population, a significant majority of stroke patients experience hearing loss. Formby et al. (1987) conducted a study specifically focusing on hearing impairment linked directly to stroke, excluding patients with prior otologic conditions or occupational noise exposure(2). Stroke can impact various levels of the auditory pathway, resulting in deficits in hearing reception and/or perception. Sudden-onset hearing loss following a stroke in the vertebrobasilar territory and/or the low brainstem is a relatively uncommon neurological impairment. Cortical or central deafness, though even rarer, can also occur. Nevertheless, research on stroke populations suggests that hearing loss is prevalent, with a past history of stroke correlating with an increased likelihood of experiencing hearing impairment, a trend not as pronounced in the general population (3). There have been cases indicating that sudden sensorineural hearing loss (SSNHL) can serve as a warning sign for vertebrobasilar infarction. The sudden onset and potential reversibility of SSNHL, combined with the vascular vulnerability of the cochlea, have led to speculation about the relationship between SSNHL and stroke. Some studies have included subjects with a history of previous stroke before the onset of SSNHL, and the study populations often exhibit high rates of comorbid conditions such as hypertension and diabetes(4). A stroke occurs when blood run to the brain is disturbed, either

due to an obstruction in a blood vessel (ischemic stroke) or bleeding in the brain (hemorrhagic stroke). When blood flow is disrupted, brain cells are damaged or die, resulting in various neurological symptoms(5).

Ischemic stroke is about 85% of all cases. The inadequate blood flow and oxygen can induce the death of brain cells, leading to permanent brain damage. When a blood vessel in the brain bursts, resulting in a hemorrhagic stroke, leads to disability or death. Hypertensive is a common reason of hemorrhagic stroke. A transient ischemic attack (TIA) occurs when there is a transitory disruption in the blood flow to the brain. The signs of a TIA are lasted for fewer hours or days, usually less than an hour. However, a TIA is an indication that a more serious stroke may occur (6).

Stroke survivors are required tertiary prevention in form of rehabilitation and disability limitation (7). Early detection of hearing impairment is crucial for maximizing outcomes in post-stroke rehabilitation, underscoring the need for clinical guidelines to advocate for hearing screening in stroke units(8). The estimation of the auditory system is indeed less common despite the severe condition of the patient and the aims of neurologic treatment. Audiologic examinations often suggest that sudden deafness, tinnitus, and impairment of sound localization are typically due to dysfunction of the cochlea resulting from stroke to the inner ear and central auditory pathways (3).

Sensorineural hearing loss (SNHL), also known as nerve-related hearing loss, is indeed defined as being caused by damage to the hair cells in the cochlea, spiral ganglia, cranial 8th nerve (auditory nerve), or the central processing auditory centers of the brain. This type of hearing loss can occur due to various factors and can range from mild to profound, affecting an individual's ability to hear sounds clearly and understand speech. (9) Sudden hearing loss can stem from various conditions spanning from minor issues such as earwax buildup to more serious conditions like stroke(10). Hearing has multiple function doing sound analysis in the spatial, temporal, and spectral domain. This necessitates the transfer of information from the ear to the auditory cortex, where it is processed to aid sound detection and perception along with memory, focus and learning lead to hearing cognition. (11) Auditory problem is frequent after a stroke due to loss of peripheral hearing or a central processing of sound (CAPD). Untreated hearing issue has negative impact relating to patient interaction and rehabilitation. The audiological evaluation of all patients with stroke are time consuming and costly. Therefore, a quick hearing test is needed (8).

This study aims to investigate the prevalence of sensorineural hearing loss (SNHL) among stroke patients. Rationale of the study is to address that early identification and management of SNHL can improve patient outcomes and reduce healthcare costs. Furthermore, understanding the relationship between stroke and SNHL can inform the development of guidelines for hearing screening and management among stroke patients. Hearing impairment can significantly impact their quality of life, communication, and rehabilitation outcomes. Suktara Sharma, et.al. conducted research on hearing disorder patients in India in 2021with sensorineural hearing loss in stroke patients. All patients underwent Pure Tone Audiograms within 15 days after the stroke's beginning, measure of hearing sensitivity, was found to be significantly higher in both ears of stroke patients compared to control participants (with a mean of 44.0 ± 12.1 dB for patients with stroke versus 36.1 ± 11.4 dB for control participants; $p = 0.001$) (12). Study conducted by Herng-Ching Lin et al. in 2018 between sudden sensorineural hearing loss (SSNHL) and the risk of stroke followed for five years. The results showed 8.7% of patients had strokes, with SSNHL (13). The association between stroke and SNHL are not fully assumed, because SNHL may result from damage to the inner ear due to low blood flow to the cochlea or inflammatory response may lead to oxidative stress and damage to the hair cells in the cochlea during stroke. Although, the frequency of SNHL in stroke patients is relatively high and may have important implications for their functional outcomes and superiority of life. Additional research is needed to better understand the primary mechanisms and to develop effective strategies for prevention and treatment of SNHL in stroke patients (14).

METHODOLOGY:

Cross-sectional analytical study on stroke participants was conducted. The investigation was carried out during a six-month period, from 22nd March 2023 to 22nd August 2023 after the approval of REC. Non-probability random sampling technique was used in this study. Men and women above age 20years were included. Patients with sensorineural hearing loss, ischemic stroke, and hemorrhagic stroke were included. Patients with conductive hearing loss, mixed hearing loss, transient ischemic stroke, congenital hearing loss and psychological hearing disorders were excluded. Pure tone audiometer and auditory brainstem response was used to measure the type and degree of hearing loss. Questionnaire of hearing threshold related was filled out by participant including patient demographic data name, age, education and other relevant personal and Audiological information.

RESULTS:

This study included a total of 224 patients with stroke, comprising 94 males (42%) and 130 females (58%). Ischemic stroke type (75%, n=168) and hemorrhagic stroke type (25%, n=56) were concluded. Regarding hearing loss, 49.6% (n=111) of the patients had sensorineural hearing loss, 29.5% (n=66) had normal hearing, 9.4% (n=21) had mixed hearing loss, 6.7% (n=15) had conductive hearing loss, and 4.9% (n=11) had high frequency sensorineural hearing loss.

Table 1: Demographics (gender, types of strokes, test performed)

Gender			
		Frequency	Percentage
	Male	94	42.0
	Female	130	58.0
	Total	224	100.0
This table shows out of 224 patients, 94 were male and 130 were female.			
Types of strokes			
		frequency	Percentage
	Ischemic stroke	168	75
	Hemorrhagic stroke	56	25
	Total	224	100
Test performed			
		frequency	Percent
	ABR	78.4	35%
	Puretone audiometry	145	65%
	total	224	100%

Table 2: Types and severity of hearing loss

Type of Hearing loss		
	Frequency	Percentage
Conductive hearing loss	15	6.7
Sensorineural hearing loss	111	49.6
Mixed hearing loss	21	9.4
Normal	66	29.5
High frequency sensorineural hearing loss	11	4.9
Total	224	100.0
Severity of hearing loss		
	Frequency	Percentage
Mild	22	9.8
Moderately severe	36	16.1
Severe	52	23.2
Profound	33	14.7
Normal	7	3.1
Total	74	33.0

Table 3: Association between type of stroke with type and degree of hearing loss

		Type of hearing loss					p-value
		Conductive hearing loss	Sensorineural hearing loss	Mixed hearing loss	Normal	High frequency sensorineural hearing loss	
Type of stroke	Ischemic	11	79	16	53	9	0.705
	Hemorrhagic	4	32	5	13	2	
Total		15	111	21	66	11	

		Degree of hearing loss						p-value
		Mild	Moderate	Moderately severe	Severe	Profound	Normal	
Type of stroke	Ischemic	15	29	36	22	6	60	0.395
	Hemorrhagic	7	7	16	11	1	14	
Total		22	36	52	33	7	74	

DISCUSSION:

Sensorineural hearing loss (SNHL) is a common comorbidity in stroke patients, which can harmfully affect their value of life and communication abilities. The prevalence of SNHL in stroke patients has been studied in several research studies, and there have been discussions on the possible mechanisms underlying this association. Findings by Herng-Ching Lin et al. in 2018, sudden sensorineural hearing loss SSNHL and the risk of stroke followed for five years. The results showed 8.7% of patients had strokes, with SSNHL (13). A study conducted by Nehzat Koohi et al. revealed that among stroke patients, the most prevalent type of hearing impairment was a combination of peripheral hearing loss and Central Auditory Processing Disorder (CAPD), particularly prominent in the 61 to 80-year-old subgroup, affecting 55% of individuals. Additionally, auditory processing deficits were observed in 40% of stroke patients aged 18 to 60 years, significantly exceeding the prevalence found in control group (7). A pilot study conducted by Suktara Sharma et al. revealed notable hearing impairment among stroke patients compared to age and sex-matched controls, with a similar prevalence of cardiovascular risk factors. This impairment was particularly noteworthy in a predominantly anterior circulation stroke population. The study suggested that undetected hearing loss could potentially influence post-stroke functional recovery (12). Qin fang et al. exposed that Individuals with severe or greater hearing loss faced a heightened risk of ischemic stroke, with an increase of 69% at speech frequency and 52% at high frequency. Moreover, severe or greater hearing loss was linked to approximately a twofold risk of hemorrhagic stroke compared to those with normal hearing, particularly at speech frequency (15).

While in our study, out of 224 patients with stroke, 168(75%) were ischemic and 56(25%) were hemorrhagic type. 15(6.7%) patients had conductive hearing loss, 111(49.6%) had sensorineural hearing loss,21(9.4%) had mixed hearing loss while 66 were having normal and 11(4.9%) were having high frequency sensorineural hearing loss ($p>0.05$). Prevalence for mixed hearing loss and conductive hearing loss show the possibility of disorder before stroke but it was not diagnosed. Data was collected in a single sitting. A specific targeted population was observed in this study which restricted generalizability

CONCLUSION:

The study concluded that there were no significant association between the type and degree of hearing loss among stroke patients. This research will be helpful for researchers in determining the prevalence of different type of hearing loss in patients with stroke over wide population. It will also help to investigate the stroke-related hearing loss, as this can aid in the development of effective prevention and treatment strategies. Overall, this research can contribute to improving the overall care and outcomes for stroke patients.

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Research Article

EVALUATION OF SARS-COV-2 SEROPREVALENCE AMONG CLINICAL LABORATORY WORKERS AND ITS ASSOCIATION WITH PAST EXPOSURE TO INFECTION AND VACCINATION

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ABSTRACT:

The pandemic of COVID-19, due to the SARS-CoV-2 virus, has significantly impacted global health. Understanding the dynamics of immunity, both natural and vaccine-induced, is crucial for public health strategies. The study aimed to determine the seroprevalence of SARS-CoV-2 antibodies among clinical laboratory workers and its relationship with previous exposure to infection and vaccination. This was a prospective observational study conducted at the chemical Pathology section of Dow Diagnostic Research and Reference Laboratory (DDRRL), Dow University of Health Sciences, Karachi, Sindh, Pakistan from 1st January to 30th December 2021. Following ethical approval, 80 clinical laboratory workers provided informed consent to participate. Blood samples were collected and tested for SARS-CoV-2 IgG antibodies. The baseline demographic and clinical information was recorded, and conducted follow-up antibody tests six months later. The mean age of the participants was 37.7 years, with a standard deviation of 9.42. There were 46 males (57.5%) and 34 females (42.5%) in the study. Half of the participants (50%) had been vaccinated, with 35% receiving a single dose and 15% receiving both doses. 71.3% of the participants had comorbidities. SARS-CoV-2 antibodies were found to be reactive in 50% of the participants. The study also found significant associations between antibody presence and prior COVID-19 infection, vaccination status, contact history with COVID-19 patients, and prior history of hospitalization ($p < 0.05$). The study compared the initial and post-booster antibody levels among three groups of subjects (vaccinated, vaccinated with no prior COVID-19 infection, and non-vaccinated with prior COVID-19 infection), and found that antibody levels were significantly high in vaccinated subjects and non-vaccinated subjects with prior COVID-19 infection (p-value < 0.05). A significant difference was observed in antibody titers among subjects with prior history of vaccination and COVID-19 infection. In conclusion both natural infection and vaccination may induce antibodies against SARS-CoV-2 infection.

Keywords: SARS-CoV-2, COVID-19, seroprevalence, vaccination, clinical laboratory personnel.

INTRODUCTION

SARS-CoV-2, the virus responsible for the COVID-19 outbreak in Wuhan, China in December 2019, caused an unprecedented global pandemic with far-reaching consequences (1). The positive-sense single-stranded RNA genome of SARS-CoV-2, a member of the Beta coronavirus family, delineated it from other viruses. Four main structural proteins are present in the virus: the spike (S), membrane (M), envelope (E), and nucleocapsid (N). SARS-CoV-2 spread widely around the globe in a short span of time, and its mechanism of invasion into the host cells is principally mediated by its Spike protein (S) attaching to the ACE-2 receptor on the host's cell membrane. Following this, the virus penetrates the host cell through endocytosis and replicates using the host's cellular machinery (2). It has been determined that there are two main ways for individuals to become immune to SARS-CoV-2 infection: naturally occurring immunity brought on by an earlier infection, and immunity acquired through vaccination.

These two immunological groups can be compared to learn important information about the efficiency of vaccines and the longevity of antibody responses. To acquire herd immunity, in which a large enough fraction of the population develops immunity to the infectious agent, it is crucial to comprehend the dynamics of immunity (3).

Several countries have approved and delivered COVID-19 vaccines globally (4). Following infection with the virus, people frequently develop immunity, which protects them from reinfection (5). However, vaccination is highly effective in triggering an immune response against SARS-CoV-2 (5, 6). The seroprevalence of SARS-CoV-2 antibodies in these two groups, naturally immune individuals and those who have received vaccinations, can be compared to provide important evidence about the efficiency of various vaccines in producing a protective immune response (7). In addition, examining the persistence of antibodies in both groups can reveal if follow-up vaccines or booster shots may be necessary to maintain immunity (5, 7).
Healthcare personnel, specifically those who perform their duties in clinical laboratory settings, have been on the cutting edge of combating the deadly virus, often facing an increased risk of exposure due to their crucial part in determining and monitoring the cases of COVID-19 (8-10). However, there is limited literature available on this particular group regarding pattern of immunity. Therefore, in this study, we aimed to determine the seroprevalence of SARS-CoV-2 antibodies among clinical laboratory workers.

METHODS:

This was a cross-sectional study, conducted at the Section of Chemical Pathology, Dow Diagnostic Research and Reference Laboratory (DDRRL), Dow University of Health Sciences (DUHS), Karachi, Pakistan between 1st January and 30th December 2021. Ethical approval was taken from the Institutional Review Board of DUHS, Karachi (Ref no IRB- 2562)/DUHS/Approval/2022/944. A sample size 80 was determined, accounting for the baseline seroprevalence of antibodies at 3% (11), the required confidence level of 95%, and the allowed margin of error of 5%. A non-probability convenience sampling was employed to collect the blood samples from 80 laboratory workers. All the laboratory personnel including consultants, resident doctors, technologists, and dispatchers more than 18 years of age were included. Pregnant females, staff with active COVID-19, and those who refused to provide consent were excluded.
The principal investigator completed a detailed predefined form for participants who gave informed written consent. 5 mL of blood was obtained from each participant and stored at -70 degrees centigrade till the analysis. Samples were thawed and analyzed for testing Anti Covid-19 IgG Antibody Quantitative assay (Roche, Cobas) using the technique of electrochemiluminescent immunoassay. Calibrators and controls were run according to the manufacturer's recommendations. Sera with a cut-off Index (COI; signal sample/cutt-off, COI >1.0 were considered positive, and those with a COI <1.0 were considered negative.
Relevant participant characteristics, such as age, gender, ethnicity, previous COVID-19 infection, history of exposure to COVID-19 patient, and sample collection date, were meticulously documented. Regardless of their vaccination status (vaccinated and non-vaccinated) and vaccination dose (one or two doses), baseline Covid-19- IgG results were recorded. A history of prior diagnosed and documented COVID-19 was recorded. To observe the longitudinal dynamics of antibody titers, 23 subjects (from 80) were randomly selected if they were vaccinated with the booster dose after an interval of 6 months from baseline sampling. Subjects were divided into three groups to observe the antibody titer pattern among study subjects. Groups 1, 2, and 3 were comprised of vaccinated subjects, unvaccinated subjects without a known history of COVID-19, and unvaccinated subjects with a history of COVID-19, respectively.

Statistical analysis

The data was analyzed using Statistical Package for Social Sciences (IBM SPSS version 26.0). Chi-square tests were used to analyze the association between SARS-CoV-2 seropositivity and prior COVID-19 exposure or vaccination status. Kolmogorov Smirnov test was used to observe the distribution of data, independent t test

was used to observe the difference in titers among three groups. The p-value cutoff for statistical significance was established at 0.05.

RESULTS:

The mean (±SD) age of the study subjects was found to be 37.7 (±9.42) years. There were 46 (57.5%) males and 34 (42.5%) females. Among all study subjects, 40 (50%) were vaccinated against COVID-19, among them 28(35%) had a single dose of vaccine, and 12 (15%) 2nd dose. A total of 27 (33.8%) subjects had a history of outstation traveling two months before the baseline sampling. Comorbidities were found in 57 (71.3%) study subjects. Among them, 36 (63.8%), 10 (17.5%), 8 (14.0%), and 3 (5.2%) were suffering from diabetes, hypertension, hypothyroidism, and seasonal allergies respectively. Among all subjects, the antibody status was found reactive in 40 (50%). However, antibody status was found to be non-reactive in 38 (50%) subjects. The details of vaccination and history of prior COVID-19 among unvaccinated subjects are shown in Table 1. Baseline antibodies median values and IQR for these groups were 7.07 (IQR- 0.5-27.0), 1.48(IQR-0.29-8.57), and 1.01(IQR-0.32-22.0) respectively with significant P-value <0.05. Medians and interquartile ranges of SARS CoV-2 antibody titers among subjects with a booster dose (n=23) are shown in Figure 1. in groups 1, 2, and 3 respectively (P-value >0.05).

Table 1: Vaccination details and history of COVID-19.

Characteristics of subjects	Antibody reactive n (%)	Antibody non-reactive n (%)	Total n (%)	P-value*
Vaccinated				
Prior COVID-19	19 (23.75)	3 (3.75)	22 (27.5)	
No prior COVID-19	6 (7.5)	12 (15)	18 (22.5)	
Non-Vaccinated				
Prior COVID 19	8 (10)	2 (2.5)	10 (12.5)	
No prior COVID 19	7 (8.75)	23 (28.75)	30 (37.5)	
Total	40 (50)	40 (50)	80 (100)	

*Chi-square Test

Table 2: Characteristics of Subjects with Vaccination status (n=80)

Characteristics	Vaccinated n (%)	Non-vaccinated n (%)	Total n (%)	P -value*
Contact History with known COVID-19 patient				
Present	22 (27.5)	15 (18.75)	37 (46.2)	**0.009**
Absent	18 (22.5)	25 (31.25)	43 (53.7)	
Travel History				
Present	16 (20)	11 (13.75)	27 (33.7)	0.151
Absent	24 (30)	29 (36.25)	53 (66.2)	
Past exposure to COVID-19 infection				
Yes	22 (27.5)	19 (23.75)	41 (51.2)	**0.000**
No	18 (22.5)	21 (26.25)	39 (48.7)	
Previous hospitalization history				
Yes	7 (8.75)	12 (15)	19 (23.7)	**0.018**
No	33 (41.25)	28 (35)	61 (76.2)	

*Chi-square Test

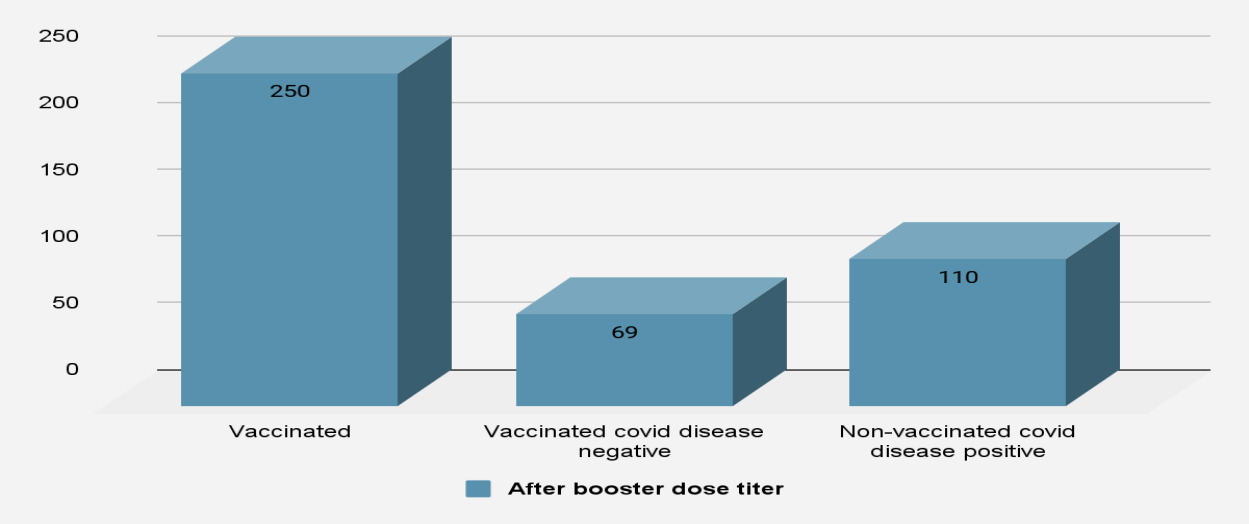

Figure 1: Antibody titers after booster dose among study subjects

DISCUSSION

Healthcare workers (HCWs) are frontline personnel who deal with the clinical management of suspected or confirmed COVID-19 patients. Literature responses indicate that laboratory HCWs face an elevated risk of occupational transmission of SARS-CoV-2 due to their crucial role in the COVID-19 response, which increases their susceptibility to viral transmission. The present study included consultant pathologists, resident doctors, laboratory technologists, and laboratory support personnel to determine the seroprevalence of SARS-CoV-2 IgG antibodies among clinical laboratory personnel and to find the association between vaccinated and non-vaccinated individuals, as well as those with and without prior COVID-19 infection.

This study revealed a notable seroprevalence rate of 50% for SARS-CoV-2 IgG antibodies among clinical laboratory personnel, indicating a significant proportion had previously been exposed to the virus or had a robust immune response following vaccination. This finding contrasts with earlier literature findings from studies, where seroprevalence rates varied considerably. Studies in Denmark reported a low prevalence of 4% (1), 12.2% in Italy (2), London (3), China, 11% in Spain (4), 13% in India (5), 11.2% in Sweden (6) 18% in Ireland (7) and 3.8% in USA (8, 9). In comparison, our study's seroprevalence aligns closely with findings reported by Korona Głowniak et al. (10) in Poland, where healthcare workers exhibited a 43% seroprevalence rate. This suggests that our observed seroprevalence is consistent with similar occupational groups in different regions, despite varying infection rates and vaccination strategies globally. The higher seroprevalence observed in our study could be attributed to several factors, including the intensity of exposure to COVID-19 within clinical laboratory settings, varying local epidemiological trends, and differences in healthcare policies and infection control practices across regions.

However, as we compare the subjects group we see high antibody titer after booster dose in groups 1(vaccinated) and group 3(un-vaccinated COVID-19 positive) as compared to group 2 (un-vaccinated without a history of COVID-19). This indicates past exposure to infection significantly raises the antibody titer as stated by the study conducted by MC Connel in Ireland(11).

This study also revealed distinct patterns based on vaccination status and prior COVID-19 infection. Specifically, 23.75% of vaccinated individuals with prior COVID-19 infection showed reactive antibodies, indicating strong immune responses post-vaccination. In contrast, only 7.5% of vaccinated individuals without prior infection demonstrated reactive antibodies. Vaccinated individuals who tested positive for COVID-19 exhibit a higher prevalence of contact history compared to vaccinated negatives and non-vaccinated positives and negatives, with a significant p-value of 0.009. Similarly, vaccinated individuals reporting past exposure to infection significantly contrast with non-vaccinated individuals, with a p-value of <0.001. Moreover, hospitalization history showed significant results between vaccinated and non-vaccinated

individuals, with vaccinated positives showing fewer hospitalizations than non-vaccinated positives, with a p-value of 0.018. Additionally, the presence of a booster dose varies among vaccinated individuals tested positive versus negative, with a p-value of < 0.01. However, travel history does not exhibit a significant association with vaccination status ($p>0.05$).

Few limitations were identified in this study that merit consideration when interpreting the findings. Firstly, the study's cross-sectional design limits our ability to establish causal relationships between variables. This design also restricts our understanding of the temporal dynamics of antibody responses over time. Secondly, the sample size of 80 clinical laboratory personnel, while sufficient for our primary analyses, may not be representative of all healthcare settings or larger populations. Additionally, the time period between sampling and vaccination was missing.

In this study, the six-month follow-up period for booster dose titer testing may capture the long-term antibody dynamics or the durability of immune responses following natural infection or vaccination. This highlights the heightened occupational risk faced by healthcare workers, particularly those in frontline roles like laboratory personnel, during the COVID-19 pandemic.

CONCLUSION

In conclusion, this study among clinical laboratory personnel revealed a significant seroprevalence of SARS-CoV-2 IgG antibodies, indicating substantial exposure to the virus or effective immune responses from vaccination.

Conflict of Interest

Authors declare no conflict of interest

Ethical consideration

The study was approved by the Ethical Review Committee of Dow University of Health Sciences, Karachi, Pakistan.

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Research Article

CURRENT POSITION OF BRUCELLA INFECTION AMONG THE HOSPITALIZED HUMAN POPULATION

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ABSTRACT

This study aimed to examine the incidence of Brucella infection among hospitalized patients. This study was conducted during February to August 2022 in District Headquarters Teaching Hospital (DHQTH) district Bannu, Pakistan. A 2mL of venous blood was collected from those individuals who visited the hospital with the complaint of joint inflammation and high grade fever. The Brucella infection was detected by Standard Plate Agglutination Test (SPAT) and Serum Tube Agglutination Test (STAT). A total of 150 samples were examined in the present study, 100 (66.66%) of them were found to be negative and 50(33.33%) to be positive for various bacterial infections. Among male positive patients 17 (56.66%) reported to have *B. melitensis* and 13 (43.33%) had *B. abortus* while in female patients 9 (45.00%), 11(55.00%) were positive of *B. melitensis* and *B. abortus* respectively. The study showed that prevalence of the disease appears to be more common in males as compared to female and age group between 41 to 50 years were more prone to the infection. In Pakistan, brucellosis continues to be a persistent and posing public health risk. Individuals who are exposed to brucellosis at work are more likely to develop infection; therefore all the exposed persons should get themselves screened.

Key words: Brucellosis, Gram negative bacteria, District Bannu, Health risk, Pakistan

INTRODUCTION

Brucellosis is caused by gram-negative bacteria namely bacilli of Brucella genus, but their species are *Brucella canis, B. suis, B. melitensis and B. abortus (*1). There are seven species of Brucella bacteria; among these three species were unknown yet who infect the human, but these species like *B. ovis* causes disease in sheep, *B. neotomae* in rodents and *B. maries* in aquatic animals like dolphins and whales. The remaining four species such as *B. abortus*, *B. melitensis, B. suis* and *B. canis* are considered more infectious to the human life. The human species are also infecting the cattle's like goat, sheep, camels and buffalo etc (2). Human life is also infectious by the direct attachment with infected animals and their use of unboiling dairy products (3). It is simply transmitted from one person to other during sexual relations and blood or bone marrow transformation (4, 5). In humans the most common symptoms including weight loss, depression, sweating, weakness and chill etc. It infects some other organs like liver and spleen also and most common cases are orchids and epididymitis (6). It is a zoonotic, which causes abortions in animals and humans (7, 8). Brucellosis is considered endemic that attack human in various regions of the world like America, Mediterranean and middle East respectively (9). In neurobrucellosis it is causes meningitis. The *B. melitensis* is destroyed the central nervous system of about five percent cases (10). The present study was aimed to diagnose the status of brucellosis among the hospitalized human population district Bannu.

METHODS

Study site description

The study was conducted in district Bannu, lies diagonally in between the 31.28^0 North latitude and 73.25^0 East longitudes. It is situated in the southern region with its borders contain Karak, Lakki Marwat districts and the North South Waziristan Agencies. The total area of district Bannu is 1,227 square kilometers, but the cultivated area is 74196 Hectors. The climate is warm in summer (48^0 C) and cooled in winter (6^0 C) season.

Blood samples collection

The current study was conducted during February to August 2022 in District Headquarters Teaching Hospital (DHQTH) district Bannu for the assessment of Brucellosis in human's population. For this study those individuals were selected who visited to the hospital with the complaint of joint inflammation and high fever. 2mL of venous blood was taken in a sterile syringe from each patient and directly brought to the veterinary hospital district Bannu for further process.

Serum plate agglutination test (SPAT)

On a glass slide 20 micro litter of serum was taken with micropipette to which a drop of each antigen, i.e., antigen for *B. abortus* and *B. melitensis* was added, the antigens and serum were mixed with tooth picks and then the slide was moved clockwise and anticlockwise, therefore, the antigens react properly with the serum then it was examined with the help of magnifier glass serum and antigens showing agglutination was considered as positive while the one having no agglutination was considered as negative.

Statistical analysis

Data analysis using Statistical Package for Social Sciences (SPSS version 20.0) was used to analyze the collected data. A chi square test was employed to compare that the P value minimum level of significance when less than $p \leq 0.05$.

RESULTS

A total of 150 samples were examined in the present study, 100 (66.66%) of them were found to be negative and 50(33.33%) to be positive for various bacterial infections. Out of the overall gender, 86 (57.33%) were reported as male and 64 (42.66%) were recorded as female. Of the males, 56 (65.11%) and 44 (68.75%) female were reported as negative. Among the positive of males 17 (56.66%) of *B. melitensis* and 13 (43.33%) of *B. abortus* were reported. In female, 9 (45.00%), 11(55.00%) of *B. melitensis* and *B. abortus* was recorded (p=0.162).

Divided into five sets of ages (years), the 20-30 years had 35 total, of which 28 (80.00%) individuals were negative and 4(57.14%), 3(42.85%) were positive of *B. melitensis* and *B. abortus* respectively. There were 21 people in the 31–40 age group, 15(71.42%) were considered negative and 6(75.00) were *B. melitensis* and 2 (25.00%) of *B. abortus*. Of the 43, 19 individuals in the 41–50, 51-60 ages range, 9 (56.25%), 7 (43.75%), 5 (83.33%) and 1 (16.66%) were positive. >60 age group obtained 32 individuals with 7 (53.84%) and 6 (46.15%) were positive for both bacteria (p=0.61). With regard to locality, rural area 21 (56.75%), 16 (43.24%) was more vulnerable to the both species of bacteria as compared to urban area (p = 0.017*). In terms of socioeconomic status (SES), there were 16 (88.88%), 2 (11.11%) more infected patients of both bacteria from the poor class with p < 0.001*, respectively.

In terms of poor hygienic condition, patients have 19 (61.29%), 12 (38.70%) higher infection rates of both bacteria with a significant difference of p=0.04*. Clinical characteristics showed that patients had high level of bodyache 10 (83.33%), 2 (16.66%), and headache 9 (75.00%), 3 (25.00%) for both infections with high significant p=< 0.0001* shown in Table 1.

DISCUSSION

A total of 150 samples were examined, among the positive of males 17 (56.66%) of *B. melitensis* and 13 (43.33%) of *B. abortus* were reported. In female, 9 (45.00%), 11(55.00%) of *B. melitensis* and *B. abortus* was recorded (p=0.162).

A study was conducted by the Din[11] total of 150 serum samples of human were collected randomly from District Bhimber Azad Jammu and Kashmir. Among these 4 (2.66%) blood samples of males were infected with *B. abortus* by SPAT while 7 (4.66%) blood samples of females were infected with *B. melitensis* by SPAT, the total prevalence of brucellosis was recorded 7.32% respectively. These results were higher from the present findings because of

careless. Another study from Pakistan was conducted by the Riaz[12] recorded 5.33% prevalence in males, while in females were reported 9.33% by SPAT respectively, these results were also higher from the present research.

Table 1: Incidence of current Brucella infection in human population

Variables	Category	Number	Negative	Positive		p-value
				B. m	*B. a*	0.162
Gender	Male	86	56 (65.11%)	17 (56.66%)	13 (43.33%)	
	Female	64	44 (68.75%)	9 (45.00%)	11(55.00%)	
Age (Years)	20-30	35	28 (80.00%)	4 (57.14%)	3 (42.85%)	0.61
	31-40	21	15 (71.42%)	6 (75.00%)	2 (25.00%)	
	41-50	43	27 (62.79%)	9 (56.25%)	7 (43.75%)	
	51-60	19	15 (78.94%)	5 (83.33%)	1 (16.66%)	
	>60	32	19 (59.37%)	7 (53.84%)	6 (46.15%)	
Socio-economic status (SES)	Poor class	65	47 (72.30%)	16 (88.88%)	2 (11.11%)	<0.001*
	Middle class	55	37 (67.27%)	11 (61.11%)	7 (38.88%)	
	Rich class	30	16 (53.33%)	9 (64.28%)	5 (35.71%)	
Locality	Rural	87	50 (57.47%)	21 (56.75%)	16 (43.24%)	0.017*
	Urban	63	50 (79.36%)	8 (61.53%)	5 (38.46%)	
Hygienic condition	Poor	79	48 (60.75%)	19 (61.29%)	12 (38.70%)	0.04*
	Good	71	52 (73.23%)	11 (57.89%)	8 (42.10%)	
Clinical Features	Fatigue	26	16 (61.53%)	3 (30.00%)	7 (70.00%)	< 0.0001*
	Bodyache	37	25 (67.56%)	10 (83.33%)	2 (16.66%)	
	Anorexia	23	19 (82.60%)	3 (75.00%)	1 (25.00%)	
	Headache	25	13 (52.00%)	9 (75.00%)	3 (25.00%)	
	Fever	21	14 (66.66%)	3 (42.85%)	4 (57.14%)	
	Sweating	18	13 (72.22%)	3 (60.00%)	2 (40.00%)	

***B. m*: *Brucella melitensis*; *B. a*: *Brucella abortus*.**

The negative male patients were 56 (65.11%) and negative female patients were 44 (68.75%) respectively. The overall incidence of *B. melitensis* was 17.33% and *B. abortus* was 16.00% respectively shown in figure 1&2.

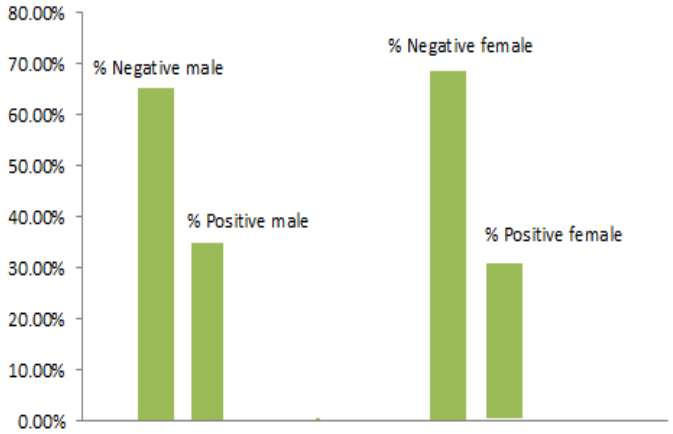

Figure 1: Sex wise Brucella infection

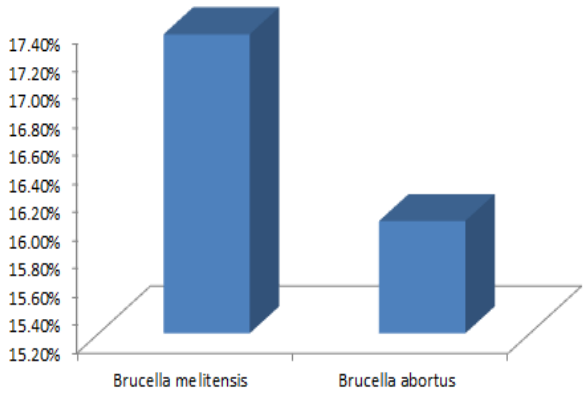

Figure 2: Species wise Brucella infection

The study was conducted by the Fevziye13 documented 3.7% brucellosis in females, 2.9% was in males respectively. The serological tests were done by the SPAT and findings were in agreement with the present study.

A study was put forwarded by the (Junaidu14 reported the prevalence of *B. abortus* in human was 4.66%, while *B. melitensis* was recorded as 6.00% by SPAT respectively. Another study was put forwarded by the Azhar15 documented high prevalence of human brucellosis by SPAT in district Swat Pakistan. The total prevalence of human brucellosis was recorded in different regions of the Libya; the regions were Yafran (40%), Jado (47%) and Yifrin (46%) respectively Ahmed (16). The prevalence of human brucellosis was documented by the Al Sekait17 in Saudi Arabia different in different ranked people. For example the higher percentile value was documented in butchers (8.9%) and lower value was in administrative peoples (1.1%). The prevalence was also recorded in abattoir workers as 4.0% and veterinarians and veterinary assistants were 5.4% respectively. A study was conducted by the Ebrahimpour (18) reported the prevalence of brucellosis in males and females were 54.37% and 45.63% respectively. Another study was conducted by the Haji Abdolbaghy (19) on Khouzestan (Iran) nomads indicated reported that the prevalence of Brucellosis in males were 38.02% and in females were 61.98% respectively. A study was conducted by the Kadhum and AL-Khafaji20 on Babylon province, Iraq reported the overall prevalence of brucellosis was 68.56%, among these *B. melitensis* and *B. abortus* were 143 (38.75%) and 110 (29.81%) respectively, in this study the females were more affected than males.

CONCLUSION

The study showed that prevalence of the disease is more in male as compared to female and age group 41-50 years were more prone to the infection. In Pakistan, brucellosis continues to be a persistent and difficult health risk. People who are exposed to brucellosis at work are more likely to have it; therefore they should take precautions like routine screening. It is imperative to update and standardize the current serological instruments and surveillance systems, particularly in light of the harsh strains of Brucella. Regulations pertaining to food safety and consumer education must to be reinforced. Ultimately, the human health sector must enhance brucellosis diagnostic facilities, raise patient awareness, and treat brucellosis cases properly.

Conflict of interest:

The authors declare no conflict of interest

Ethical consideration:

The study was approved by local research ethics committee

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Research Article

CORRELATION BETWEEN PARENTING STYLES AND SOCIAL COMMUNICATION IN CHILDREN WITH HEARING IMPAIRED

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ABSTRACT:
This study aimed to find the correlation between parenting style and social communication in children with hearing impairment. In this correlational study Minnesota Social skills checklist for Deaf/ hard of Hearing children and Parenting Style Questionnaire was used. Through convenient sampling technique data was collected from the parents of hearing impaired children aged between 5 to 15 years. Study was conducted over a period of 6 months (July 2023 to January 2024) at Riphah International University. Sample size was n= 377 calculated by using online sample size calculator. The results of the study showed a strong, significant correlation between parenting style and social communication. In conclusion the three parenting styles analyzed, authoritative parenting has a positive effect on social communication skills, whereas authoritarian and permissive parenting styles have a negative effect.

Keywords: Hearing impaired children, deaf, hard of hearing, parenting style, social communication

INTRODUCTION

Hearing is the sense which allows us to hear sounds, interact with our environment, communicate with others and enhance our knowledge. As a human being hearing is the important sense. Without this sense person is hearing impaired. Hearing impairment and deafness are two different categories in which the individual need special education and other programs related to special needs. Hearing impairment is defined according by IDEA as it is an impairment in which it is permanently or partially affect child`s education and performance. Deafness is a degree of loss that is severe or permanent in which the child is impaired in language and speech (1).

The concepts of hearing impairment and deafness, as well as their significance in education and special programs is relatively new. Deafness typically denotes a more severe degree of hearing loss. It often implies a significant or permanent hearing loss to the point where the individual may have difficulty to understanding spoken language and may rely on alternative forms of communication, such as sign language or cochlear implants. Deafness can profoundly affect a child's academic capability (2). One of the key building blocks for the development of language is through to the hearing. In human beings the frequency of hearing is 20 to 20,000 Hz and the intensity is 0 dB to 120 dB. In 0 dB there is no sound, but the unimpaired human ear can hear the softest sound while some people hear down -5 or -10 dB. The threshold of pain is represented when the sound is 90dB and 116 dB is uncomfortably louder sound. The human ear cannot hear all frequencies equally, the sensitivity of hearing is around 3,000 Hz (3).

The first step in devising additional test procedures and coordinating clinical or potentially audiological interventions is to define hearing loss according to nature, degree and configuration. Hearing impairment is divided into three categories (a) sensorineural hearing loss (b) conductive hearing loss (c) mixed hearing loss

Sensorineural hearing loss: this is occurring when inner ear or hearing nerve (vestibulocochlear nerve CN VIII) become damaged. In the cochlea some of hair cells are damaged. It is most common type of hearing loss(4) .

Conductive hearing loss occurs when outer or middle ear cannot carry sound waves in the inner ear. Sound waves blocked by earwax or a foreign object located in ear canal and in the middle ear space filled with fluid, infection, abnormal bone growth or damage of eardrum (5). Mixed hearing loss demonstrates combination of both sensorineural and conductive(6).

The other aspect of the study was parenting style, which is defined as the parent's attitudes and behaviors towards their children and the emotional and psychological climate and behaviors are expressed by parents. Parenting style is one of the most important to develop the child's behavior, and effect the child lifestyle, in both positive and negative way. Parenting style can affect child`s self-esteem and physical health. Parenting style also helps to support healthy growth and development because the way parents interact with children and how they discipline them. In parenting style cultural background has major impact on child development (7).

There are four types of parenting styles based on responsiveness and demandingness (8).

Authoritative parenting style: It is characterized by responsiveness and demandingness which is on higher priority. In this parenting style parents do not provide any kind of support and warmth, but they have defined rule and discipline (9).

Authoritarian parenting style: It is characterized by the responsiveness are low but demandingness is high. In this style parents are used to control and make harsh punishment and allow verbal give and take by seldom provide(10).

Permissive parenting style: This style tends to warm, nurturing and having no expectation. Parents impose limited rules, communication remain open, and their children are allowed to figure out things by themselves (11).

Neglectful parenting style: It is characterized by the low/less in both responsiveness and demandingness (12).

Parenting style is greatly influenced by social communication. Communication is a two-way process which include the interaction with peers, family, relatives, teachers, and other people. Social communication behavior includes understanding, use of facial expression, eye contact, gestures and body language (13). A research conducted by Dr Kausar Parveen and Maria Mustafa in 2013 regarding the role of parenting style in social communication with hearing impaired children, which showed that parenting style can indeed have a significant impact on the development and social communication of children, including those with hearing impairments. Current study also used a parenting style questionnaire to assess the parenting styles of the parents. The questionnaire likely helped categorize parents into different parenting styles, such as authoritative, authoritarian, permissive, or neglectful. These parenting styles can influence how parents interact with and support their children, including those with special needs. The importance of family dynamics and attitudes in the context of raising a hearing-impaired child. If family members view the birth of a child with special needs as an undesirable change in their lives, it can lead to added stress and challenges within the family unit. This stress may increase the risk of a crisis response from the family (14).

Family therapy can be a valuable resource in such situations. It can help parents and other family members navigate the challenges and emotions that come with raising a hearing-impaired child. By providing support, guidance, and strategies for effective communication and parenting, family therapy can empower parents to be more effective change agents and caregivers for their children. Overall, research in this area helps us understand the complex interplay between parenting styles, family dynamics, and the social communication development of hearing-impaired children (15).

Diana Baumrind is a well-known psychologist who has contributed to the study of parenting styles and child development. The summarized key elements of Baumrind's approach to effective parenting include: Scaffolding of children`s competence: This refers to parents providing support and guidance to help children develop their skills and competencies. It also includes fostering social competence through shared activities and conversations, where parents actively engage with their children to enhance their abilities (16).

The Parental Acceptance-Rejection Theory (PART) was indeed formulated by Ronald P. Rohner in 1980. This theory focuses on the impact of parental acceptance or rejection on a child's development, encompassing cognitive, emotional, and behavioral aspects. It provides insights into how a child's upbringing, particularly the way they are treated by their parents, can have far-reaching consequences throughout their lives. Theoretical foundation: The Parental Acceptance Rejection Theory is a socialization that seeks to explain and predict how parental acceptance or rejection influences various aspects of a child's development. It is grounded in the belief that the parent-child relationship plays a critical role in shaping a child's personality and behavior (17).

Parenting a deaf or hard of hearing (d/hh) child indeed comes with its own set of challenges, and it is important to recognize and address the unique aspects of raising a child with hearing differences. Parents of d/hh children may face uncertainties and difficulties due to the lack of a well-established model or societal norms to follow. Here are some considerations for parents raising a d/hh child (18).

Early intervention is crucial for a d/hh child's development. Engaging with professionals such as audiologists, speech therapists, and educators who specialize in working with deaf and hard of hearing children. Learning about communication options, including sign language, speech therapy, and assistive technologies. Making informed decisions based on your child's needs and preferences (19).

Vygotsky emphasized the role of social interaction in cognitive development. According to his theory, learning and cognitive development are deeply connected to social and cultural activities. He believed that children can achieve higher levels of understanding and skill acquisition when they engage in activities with more skilled peers or adults. In the example provided about solving a puzzle, where the unaided attempt represented the child's independent level. The ZPD (zone of proximal) is the range of tasks that the child cannot do alone but can do with assistance. By interacting with a more skillful peer or adult who provides guidance and clues, the child can operate within their ZPD and gradually internalize the knowledge or skills. This cooperative learning process is a fundamental aspect of Vygotsky's educational philosophy. In Vygotsky's view, the social and cultural context plays a crucial role in shaping an individual's cognitive development (20). This study was aimed to evaluate influence of parenting style on communication of children with deafness or hearing disabilities.

Material/Subjects/Patients and methods

The duration of this cross-sectional study was 6 months. The sample size was 377 calculated by online sample size calculator by keeping 95% confidence level and 5% margin of error(21) . Sample population includes parents of the children in the age range of 5 to 15 years who were taking speech session. Hearing impaired children were at Mild, Moderate, Severe and Profound level. However, Parents who have children with other disabilities were not included.

Parenting style questionnaire: This tool was used for parents to identify the unique parenting style which can be categorized into Authoritarian, Authoritative and Permissive style. A total of 30 item questionnaire was created by Robinson, Mandleco, Olsen, and Heart and used in this study.

Minnesota social skill checklist for deaf/hard of hearing: This tool was used for development of self-concept/self-esteem, social interactions/friendship skills, and pragmatics is crucial for learners who are deaf or hard of hearing.

The Parenting quiz questionnaire and Minnesota social skill checklist for deaf/hard of hearing were used for data collection. Data collected after taking consent from participants' declaration by Riphah international university

Lahore, Pakistan. Once the approvals were granted, data was collected by special institute and clinics. Consent form were filled by individuals who meet the inclusion criteria.

Data analyzed using standard Statistical Package for Social Sciences (SPSS version 21.0) statistical software in which correlation was calculated using Pearson Product-moment correlation.

Results:

A total of 377 children with hearing disabilities were included in the study, out of which 200 were males and 177 were females (Figure 1) age ranged between 5 to 15 years with median age of 12 years (Figure 2). Majority of families had 1 child with hearing disability (Figure 3). The duration of deafness was between 1 to 10 years (Figure 4), conductive hearing loss was most frequently seen (Figure 5), while majority had moderate hearing loss (Figure 6), Majority used hearing aid (Figure 7) with unilate4ral fitted device (Figure 8).

Correlational analysis showed that there was a statistically significant positive correlation (p-value=0.001) between Authoritative Parenting Style and Effective Social Communication, suggesting that higher levels of authoritative parenting are associated with better social communication skills in the sample population. There was a statistically significant negative correlation (-0.348) between Authoritarian Parenting Style and Effective Social Communication (p-value 0.001), suggesting that higher levels of authoritarian parenting are associated with poorer social communication skills in the sample population. There was a statistically significant negative correlation (-0.264) between Permissive Parenting Style and Effective Social Communication, suggesting that higher levels of permissive parenting are associated with poorer social communication skills in the sample population. A summary is given in Table 1.

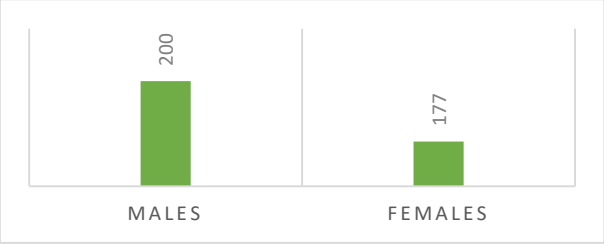

Figure 1. Gender distribution of the samples included in the study

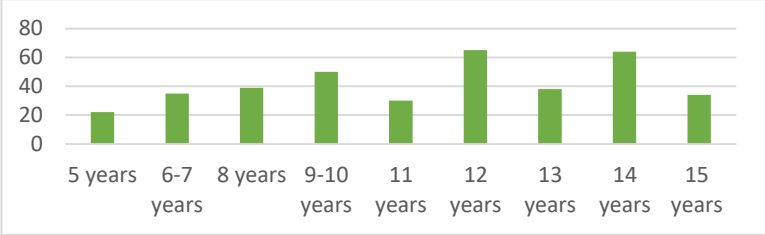

Figure 2. Age distribution if the children with deafness or hearing disabilities included in the study

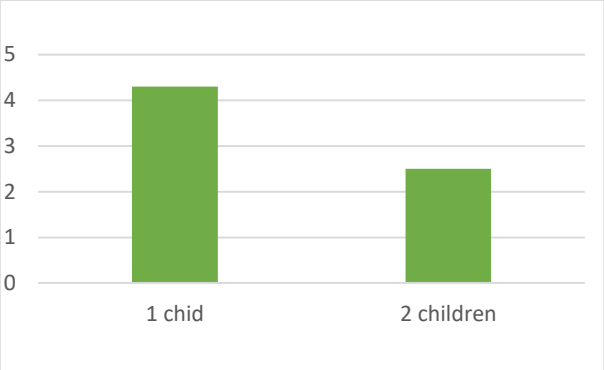

Figure 3. Pattern of number of children with hearing disability in the family

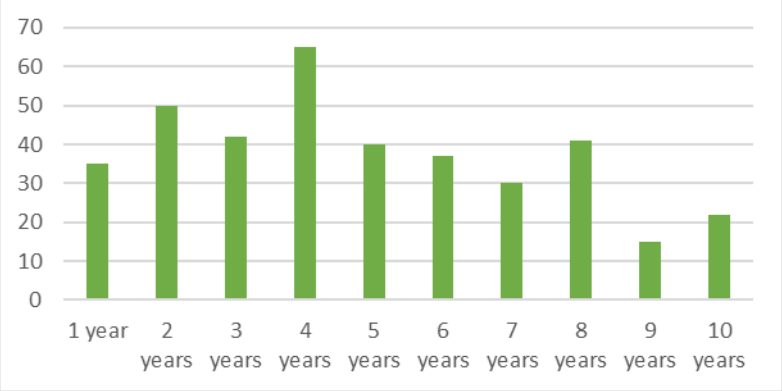

Figure 4. number of years with hearing loss

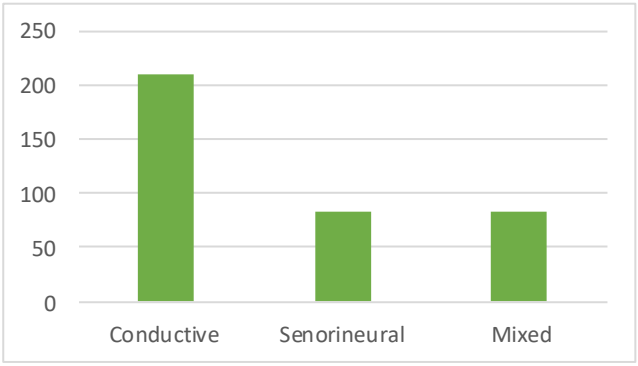

Figure 5. Pattern of type of hearing loss in children included in the study

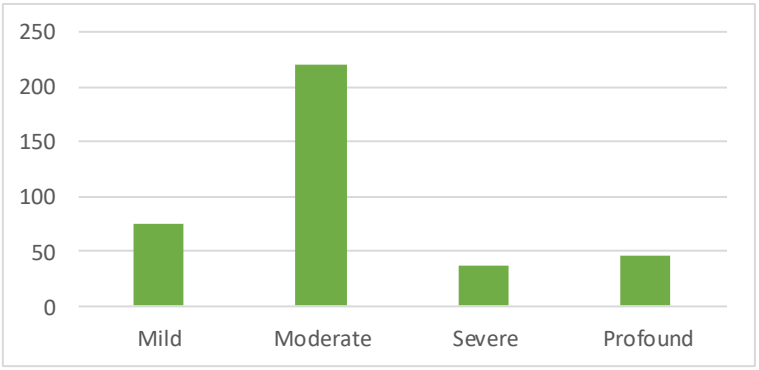

Figure 6. Pattern of severity of hearing loss in children participants

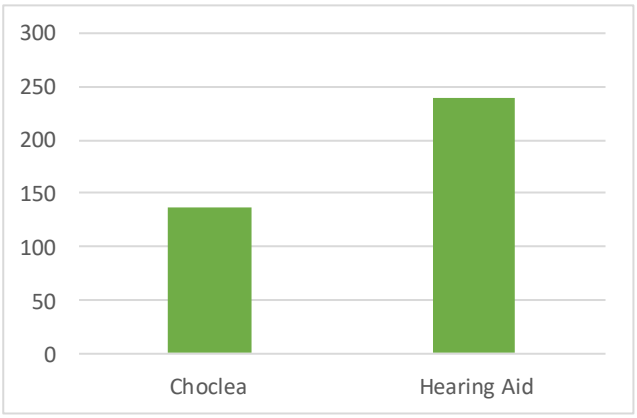

Figure 7. Type of hearing aid used in the participants of the study

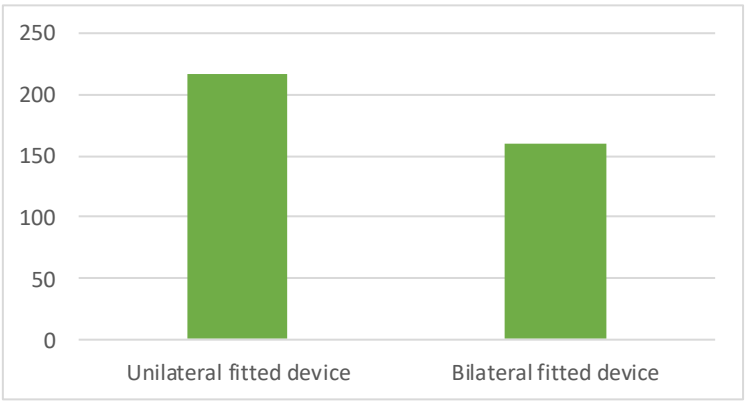

Figure 8. Pattern of use of fitted device in the participants of the study

Table 1. Correlations between different parenting styles and social communication skills (ESSC).

Parenting styles	Pearson correlation	Significance (2- tailed)	N= no of participants	Description
Authoritative (APS)	0.228**	0.001	209	Positive and significant correlation (Pearson r = 0.228, P < 0.01)
Authoritarian (ATPS)	-0.348**	<0.001	100	Negative and significant correlation (Pearson r = -0.348, P < 0.01)
Permissive (PPS)	-0.264**	<0.001	67	Negative and significant correlation (Pearson r = -0.264, P < 0.01)

DISCUSSION:

The aim of the study was to find the correlation between parenting style and social communication with hearing impaired children. It is very crucial and important to know about the family environment when it comes to

identification of the problems of children with hearing impaired in different aspect of mental, physical, social and cognitive problem. Perhaps many of the issues are related to children with HI and their parents. It is important to note that family is the first and most unique social institute and positive relationship within the family. The role of children with hearing impairment in the parenting style and social communication is very important (22).

A study conducted in 2015 that shows children with hearing impairment significantly shows impairment in social communication(21) so awareness among parents regarding parenting styles is important to improve the social communication skills for children with hearing impairment.

By looking the mean and standard deviation of mother`s scores in parenting style. It obtains a relatively clear picture about the social communication and parenting style. Current study with 377 participants use the social communication checklist and parenting style questionnaire. The questionnaire applied for data collection to analyze the correlation between parenting style and social communication with HI children. The age range of children was 5 to 15 years. About 75 were mild hearing loss, 220 were moderate, 25 were severe and 45 were profound. Securely attached individuals develop the positive early environment fosters the development of secure attachment, which has implications for emotional regulation and social interactions throughout life. Securely attachment individual is related to the Authoritative Parenting Style which have positive relationship with mental health and social development (23).

Insecure attachment patterns, which can result from inconsistent or emotionally unresponsive care giving, have been associated with negative outcomes in various areas of a person's life, including their self-perception, behavior, and mental health. Insecure attachment shows misbehavior towards their peers. Insecure attachment patterns are related to the Authoritarian Parenting Style (24).

Permissive parents are characterized by being nurturing and accepting but tend to be low in demandingness and structure. This parenting style impact on children like lack of structure and guidance, independence without guidance, lack of responsibilities, lower cognitive development and behavioral problem (25).

Minnesota social skill checklist for deaf/hard of hearing tools and strategies to address the development of self-concept/self-esteem, social interactions/friendship skills, and pragmatics is crucial for learners who are deaf or hard of hearing. These areas are vital for overall social and emotional well-being. This tool is based on the unique needs and preferences of each student. Creating an inclusive and supportive learning environment can significantly contribute to the development of these essential skills for learners who are deaf or hard of hearing (26). The South African study conducted in 2011.It indicates that children with hearing impairment who actively participate in community and extracurricular activities have positive social interactions. This implies that involvement in such activities can contribute to the development of constructive social skills in children with hearing impairment (27).

In another research the role of children within the family is highlighted, particularly in terms of parental communication. The communication patterns between parents and children play a crucial role in shaping the social and psychological behavior of the children. Consistent and supportive communication is deemed important for fostering appropriate social and psychological development in children. This perspective aligns with broader sociological and psychological theories that emphasize the impact of family dynamics on individual development and societal outcomes. Positive family interactions and effective communication are seen as foundational elements that contribute to the overall health and functionality of both the family unit and, by extension, the larger society. Understanding the role of family in shaping behavior and well-being is crucial for developing interventions, policies, and support systems that promote positive family environments. It acknowledges the interconnections of individual, family, and societal health (28).

CONCLUSION:

Parenting styles play significant role in developing of social communication skills. The three parenting styles analyzed, authoritative parenting has a positive effect on social communication skills, whereas authoritarian and permissive parenting styles have a negative effect.

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Research Article

AGE, PARITY AND STAGE OF CERVICAL CANCER AMONG CERVICAL CANCER PATIENTS ATTENDING ONCOLOGY DEPARTMENT; AN OBSERVATIONAL CROSS SECTIONAL STUDY

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ABSTRACT:

Cervical cancer is one of the common cancers in women worldwide. This study was conducted to determine age, parity and stage of cervical cancer patients in Pakistani population. This was a prospective cross-sectional study, conducted in the Oncology Department of Jinnah Postgraduate Medical Center, Karachi during October 2023 to January 2024. A total of 92 women of age 18 years or above, presenting with biopsy proven cervical cancer were recruited. The mean age of study participants was 53.4 years SD± 10.9 years. The highest proportion of cases were recorded between 47 to 57 years of age with a proportion of 37.0% (n=34). Among the study participants 62% (n=57) had a history of multiparty with at least five or more children and 65% (n=60) were postmenopausal women, while 59.8% (n=55) were found to have Stage-II and Stage-III disease at the time of diagnosis. Histopathologically Squamous Cell Carcinoma was the most frequent histopathological type reported. In conclusion the highest burden of cervical cancer was found to be present among the women of age group 47 to 57 years. Cervical cancer was most prevalent among women with higher parity or having five or more children. Squamous cell carcinoma was the most frequently occurring histopathological type, while most patients were diagnosed at the stage-II disease.

Key Words: Cervical Cancer, Age, Parity, Cancer, Epidemiology.

BACKGROUND:

Cervical cancer is globally recognized as one of the common cancers among women. The burden of cervical cancer related mortality is relatively much higher in Asian countries due to lack of public awareness regarding Human Papilloma Virus (HPV) infection and screening as well as unavailability of vaccine to general public in most Asian countries (1,2). Pakistan is an Asian country where cervical cancer burden is still on rise (3). Studies conducted at tertiary care hospitals in Sindh and Punjab have identified cervical cancer as the second most common gynecological malignant disorder among females in Pakistan (4-6). However, the knowledge about prevention of cervical cancer and related practices is still unsatisfactory. A recent study, conducted in Karachi has reported low frequency for cervical cancer screening and poor knowledge of the disease including awareness regarding vaccination against HPV (7). A small scale study previously conducted in 2009 at the Nuclear Institute of Medicine and Radiotherapy (NIMRA) found that cervical cancer was relatively more common among women of age 40 years and above and women having five to seven children. The study also found that almost 80% of the cervical cases were presented with advanced disease in the stage-II, III and IV (8). Moreover, despite being recognized as the common gynecological cancer still there is dearth of local data regarding distribution of cervical cancer according to women's age, parity and severity of the disease. Identification of disease patterns in context of basic social demographic characteristics among cervical cancer patients in the local population will help in identification of women at high risk of the disease in our community. Hence, this study aimed to determine the pattern of age, parity and stage of cervical

cancer among patients attending oncology department at Jinnah Postgraduate Medical Center, Karachi, Pakistan. Findings from this study may help in improving cervical cancer screening and related prevention efforts in Pakistan.

METHODS:

This was a prospective cross-sectional study conducted in the Oncology Department of Jinnah Postgraduate Medical Center (JPMC), Karachi, Pakistan during October 2023 to January 2024. The JPMC is one of the biggest tertiary care public hospitals in Karachi offering oncology services for all kinds of cancers including cervical cancer. The patients from all over the province of Sindh as well as other provinces visit this facility for the treatment cancers. For this study, women of age 18 years or above, presenting at Oncology Out Patient Department (OPD) of JPMC and with biopsy proven recent diagnosis of cervical cancer were approached and invited to participate in this study. The study participants were recruited by applying a convenient sampling technique. However, written informed consent was obtained from each study participant at the time of enrollment in the study and data collection. Any eligible woman who was not willing to provide written informed consent was excluded from the study. The ethical approval for this study was obtained from the Institutional Review Board of Jinnah Postgraduate Medical Center, Karachi. The sample size for this study was calculated using OpenEpi software for an approximate finite population of 120 cervical cancer patients attending JPMC Oncology department in a year. Hence, at a 5% level of significance, precision of 5% and anticipated population proportion of 46%, a sample size of 92 was calculated (3,8).

The data was collected using a structured questionnaire which was translated into local language i.e. Urdu and pre-tested for cognitive validity as well as lingual validity before the start of actual data collection. The information was collected regarding the socio-demographic characteristics such as age, sex, literacy, marital status, number of marriages, age at first marriage, parity, ethnicity and occupation. The information regarding disease diagnosis including histopathology findings or type as well as stage of cancer were also gathered from the medical records available with the patient. The patients whose cancer staging or diagnosis was incomplete were followed on phone to collect the required information. All the data was collected by trained data collectors. Patients` privacy was maintained during the process of data collection while the confidentiality of the information related to each study participant was maintained throughout the study by following standard procedures and principles of biomedical ethics.

Statistical Methods

The data was analyzed using Statistical Package for Social Sciences version 24. Descriptive statistics were calculated for the socio-demographic and health related characteristics. Chi-square test of significance was applied to assess the possible differences in the presentation of disease due to differences in various socio-demographic characteristics. A p-value <0.05 was considered significant.

RESULTS:

In total 104 patients who visited the OPD at the Oncology Department at JPMC during the study period were approached and invited to participate in this study. However, only 92 of these women provided informed consent and participated in this study with a response rate of 88%. All the study participants were married Pakistani women from various ethnicities.

The mean age of the study participants was 53.4 years $\pm$SD 10.9 years and the youngest woman diagnosed with cervical cancer was 25 years of age. However, 4.3% (n=04) of all the cervical cancer patients who participated in this study were of age between 25 to 35 years. The highest proportion of the study participants was recorded for the age group between 47 to 57 years with a proportion of 37.0% (n=34) and the age group 58 years or above with a proportion of 34.8% (n=32). Majority of the study participants did not have formal education i.e. 67.4% (n=62). High proportion of women 94.6% (n=87) were unemployed while only 5.4% (05) were employed or working for income generation purposes. The most common ethnicity was Urdu speaking community followed by Sindhi with a proportion of 54.3% (50) and 28.02% (n=26) respectively. The mean duration of marriage as reported by the participants was 33.5 years $\pm$11.8 years. A 62% (n=57) of all the women participants had a history of multiparty with at least five or more children while 65% (n=60) of all the study participants were postmenopausal women. Stage II

and Stage III was found in 59.8% (n=55) of all the study participants while Squamous Cell Carcinoma was identified as the most frequent histopathological diagnosis (Table: 1).

Table: 1 Socio-demographic and health-related characteristics of the study participants diagnosed with Cervical Cancer at Oncology Department JPMC, Karachi (n=92)

Variable	Frequency (n)	Percentage (%)
Mean Age:53.4(SD±10.9)		
Age (in completed years)		
25- 35 years	04	4.3
36 -46ears	22	23.9
47-57years	34	37.0
58 years and above	32	34.8
Education		
Illiterate	62	67.4
Literate	30	32.6
Occupation		
House maker	87	94.6
Employed	05	5.4
Ethnicity		
Sindhi	26	28.2
Urdu	50	54.3
Punjabi	06	6.5
Balochi	01	1.1
Pashto	06	6.5
Others	03	3.2
Age at first marriage (in completed years)		
Median age: 20 years (IQR: 3 years)		
< 18 years	06	6.5
18-23 years	79	85.9
24 years and above	07	7.6
Duration of marriage (in completed years)		
Mean Duration: 33.5 years (SD ±11.8 years)		
10 years or less	02	2.2
11-20 years	10	10.9
21-30 years	26	28.3
31 years or more	54	58.7
Number of alive children /parity		
1-2 children	06	6.5
3-4 children	39	31.5
5 or more children	57	62.0
Reproductive Phase or Menstrual status		
Premenopausal Phase	32	34.8
Postmenopausal Phase	60	65.2
Cancer stage at the time of diagnosis		
Stage-I	15	16.3
Stage-II	30	32.6
Stage-III	25	27.2
Stage-IV	22	23.9
Histopathological diagnosis		
Squamous Cell Carcinoma	80	87.0
Adenocarcinoma	11	12.0
Others	01	1.1

The study participants reported a variety of symptoms related to cervical cancer. Most frequently reported symptom was pain in the lower abdomen reported in 54.3% (n=50), followed by postmenopausal bleeding in 47.8% (n=44), while 35.9% (n=33) of the study participants reported having vaginal discharge (Figure 1).

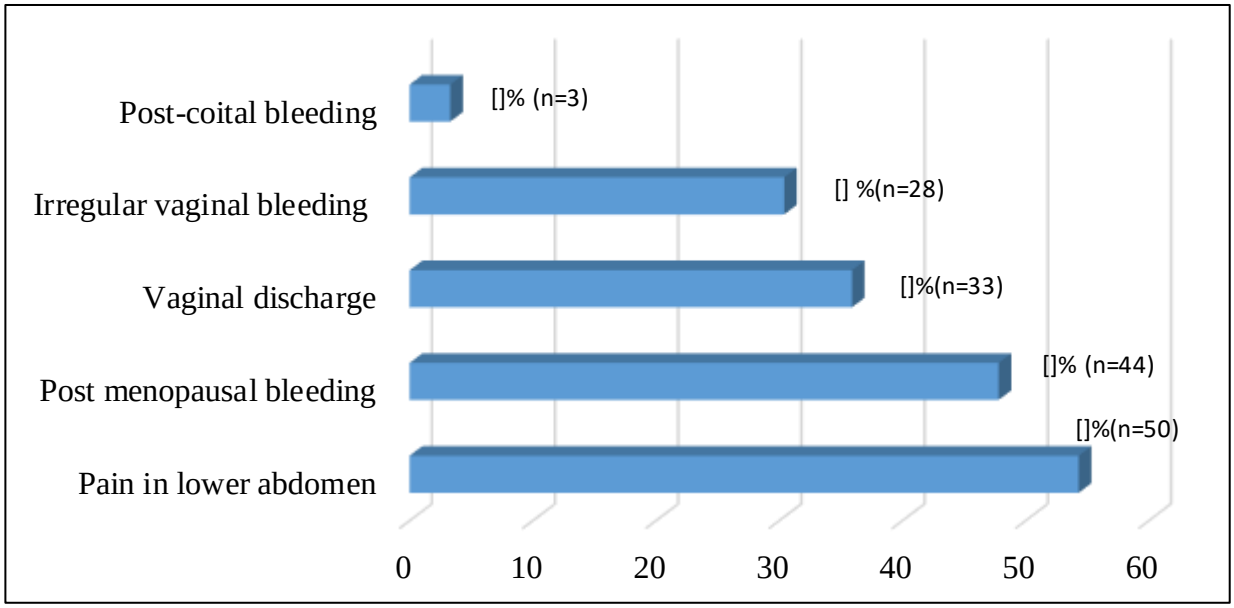

Figure 1: Frequency of presenting signs and symptoms reported by patients with Cervical Cancer visiting OPD at Oncology Department JPMC, Karachi (n=92)

The study also compared various social demographic and disease related characteristics among women in different age groups (Table: 2). The study found statistically significant differences in literacy, marriage duration, parity and reproductive phase or status (p-value ≤ 0.05).

DISCUSSION:

This study aimed to see the pattern of cervical cancer presentation among women diagnosed with cervical cancer with respect to age, parity and stage of disease. In our study, the average age of women who were diagnosed with cervical cancer was 53.4 years. This is comparable to the previous estimates for the age of cervical cancer diagnosis from Pakistan as well as countries like India, Morocco, Tanzania and Kenya (8-12). Literature supports that age is more than 50 years, less education and parity more than five among the common risk factors for the development of cervical cancer. Moreover, age older than 50 years is found to be associated with cervical cancer. The advanced stage at diagnosis among older women can be explained by the limited financial and social empowerment of older women as well as reduction in number of visits to healthcare facilities once they complete their family or reach menopause; hence limited chances of Pap smear test for cervical cancer screening. The older women become much more dependent on others for their healthcare needs in countries where healthcare is expensive or health insurance is not provided by the government. However, in some populations the diagnosis is delayed even in younger women due to lack of awareness regarding disease and related signs and symptoms (12-14). The evidence from Pakistan reports severe lack of awareness regarding cervical cancer and available screening tests among women as a major barrier to cervical cancer screening; hence resulting in diagnosis in advanced stages of the disease (15). This also supports a considerably lower number of study participants in the youngest age group i.e. 25 to 35 years.

In this study the average age at first marriage or at the time of first intercourse was 20 years which is in line with the previous studies (8,9). Majority of the women with cervical cancer diagnosis were uneducated, had parity more than 5 children, postmenopausal and diagnosed at Stage-II and Stage III. Hence, these findings are in line with the previous studies conducted in Pakistan and similar populations as well as populations from a different genetic and socio-cultural background such as Nigeria (16-20).

This study did not find significant differences in the disease and social demographic characteristics of women with cervical cancer from different age groups except for literacy, parity and reproductive status. This can be explained largely by the smaller sample size of this study. Similarly, this study could not find any significant

difference in the histopathological diagnosis among women with cervical cancer from different age groups which is contrary to previous evidence (21).

Table: 2 Socio-demographic and health-related characteristics of the study participants diagnosed with Cervical Cancer at Oncology Department JPMC, Karachi (n=92)

Variable	25- 35 years (n=4)	36 -46ears (n=22)	47-57 years (n=34)	≥58 years (n=32)	p-value
	Frequency (Percentage)				
Education					
Illiterate	04(6.5)	20(32.3)	25(40.3)	13(21.0)	0.001
Literate	0	02(6.7)	09(30.0)	19(63.3)	
Occupation					
House maker	0	01(20.0)	02(40.0)	02(40.0)	1.0
Employed	04(4.6)	21(24.1)	32)36.8)	30(34.5)	
Age at first marriage					
< 18 years	0	02(33.3)	02(33.3)	02(33.3)	
18-23 years	03(3.8)	18(22.8)	29(36.7)	29(36.7)	0.214
24 years and above	01(14.3)	02(28.6)	03(42.9)	01(14.3)	
Duration of marriage					
10 years or less	02(100.0)	0	0	0	
11-20 years	02(20.0)	08(80.0)	0	0	<0.001
21-30 years	0	14(53.8)	12(46.2)	0	
31 years or more	0	0	22(40.7)	32(59.3)	
Number of alive children /parity					
1-2 children	02(33.3)	01(16.7)	01(16.7)	02(33.3)	<0.001
3-4 children	02(6.9)	13(44.8)	13(44.8)	01(3.4)	
5 or more children	0	08(14.0)	20(35.1)	29(50.9)	
Reproductive Phase					
Premenopausal Phase	04(12.5)	22(68.8)	04(12.5)	02(6.3)	<0.001
Postmenopausal Phase	0	0	30(50.0)	30(50.0)	
Cancer stage					
Stage-I	02(13.3)	03(20.0)	05(33.3)	05(33.3)	
Stage-II	01(3.3)	09(30.0)	12(40.0)	08(26.7)	0.613
Stage-III	0	06(24.0)	11(44.0)	08(32.0)	
Stage-IV	01(4.5)	04(18.2)	06(27.3)	11(50.0)	
Histopathological diagnosis	04(5.0)	04(36.4)	03(27.3)	04(36.4)	0.55
Squamous Cell Carcinoma	0	01(100.0)	0	0	
Adenocarcinoma	0	17(21.3)	31(38.8)	28(35.0)	

These findings can be explained by the limited sample size of this study. Moreover, the particular study setting of this study specifically represents the women from lower and lower-middle class of the society who cannot afford private cancer treatment. This warrants the need of large scale studies with sufficient sample size and probability sampling technique to obtain more reliable and valid estimates. Nevertheless, this study has provided a good analysis in terms of epidemiology of cervical cancer among women in Pakistan

presenting in one of the biggest tertiary care hospitals in Karachi; for the treatment from different ethnic and social backgrounds.

This study has limitation that the data was only collected from one public sector hospital of Karachi, Pakistan; thus its difficult to generalize its findings. Similarly, the average age at first marriage can be much lower than what is reported by this study for rural populations and women from specific cultural or ethnic backgrounds. Moreover, in this study every participant reported only one marriage in her lifetime. Similarly, again considering the cultural sensitivity we couldn't ask about the number of sexual partners or the questions about HPV infection and risk factors were not addressed in this study. In addition, this study didn't collect information about the history of past infection with HPV, screening for HPV infection, history of vaccination for HPV infection as well as history regarding use of cervical Pap smear for screening among the study participants. The availability of HPV vaccination and implementation of Pap smear for screening purposes have widely changed the epidemiology of cervical cancer in many developed as well as developing countries (22). Nevertheless, this study presents much needed evidence about cervical cancer epidemiology in the local context.

CONCLUSION:

The common age of presentation of cervical cancer is between age 47 to 57 years. And women with high parity at higher risk and squamous cell carcinoma are the most common pathological type while most patients had stage 2 disease.

CONFLICT OF INTEREST:

Authors declare no conflict of interest

ETHICAL CONSIDERATION

The study was approved by local Research Ethics Committee.

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Case Series

CONQUERING CMV VIREMIA WITH CMV IMMUNOGLOBULIN, TRIUMPH IN RENAL TRANSPLANT PATIENTS: A CASE SERIES

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ABSTRACT:

This case series offers the successful management of cytomegalovirus (CMV) viremia in patients who developed CMV infection post renal transplantation. The patients have been treated with three doses of CMV immunoglobulin and ganciclovir for 21 days. The CMV load in each affected person extensively reduced after treatment, indicating the effectiveness of this regimen in coping with CMV viremia in resource constrains setting.

Keywords: CMV viremia, renal transplantation, CMV immunoglobulin, ganciclovir, treatment

BACKGROUND:

Cytomegalovirus (CMV) viremia is a common infection in patients who undergo solid organ transplantation(1). It can result in great morbidity and mortality if not controlled efficaciously (2). In this case series we treated three patients with low dose of CMV immunoglobulin along with ganciclovir for 21 days followed by valganciclovir for 3 months in prophylactic dose and the results were promising. The goal of this case series is to focus on the effectiveness of CMV immunoglobulin used in low doses, to treat viremia successfully in post-renal transplant.

CASE SERIES:

Case 1:

The first case involves a 21-year-old boy who underwent renal transplantation in May 2023, due to IgA nephropathy. He presented with fever cough, shortness of breath and loose stools on and off. He had a high CMV load of 98,027 copies pre-treatment, which significantly decreased to 63,000 copies after receiving three doses of CMV immunoglobulin 2.5gm/50ml and ganciclovir for 21 days. This significant reduction in CMV load indicates a successful management of CMV viremia in this patient.

Case 2:

The second case features a 16-year-old boy who went through renal transplantation in September 2023, secondary to chronic sclerosing glomerulonephritis. He developed esophagitis secondary to CMV, apart from difficulty in swallowing he was completely asymptomatic. His CMV load was initially 936,786 copies, which decreased to 700,000 copies after receiving the same treatment regimen. This significant reduction in CMV load suggests an effective management of CMV viremia in this patient.

Case 3:

The third case involves a 25-year-old male who underwent renal transplantation in May 2021 and developed loose stools secondary to CMV viremia. His CMV load prior to treatment was 750,000 copies.

The post-treatment CMV load became negative; he also received the same treatment regimen.

DISCUSSION

CMV viremia is a chief situation following renal transplantation (3), as it may lead to graft disorder and various other complications (2). CMV is a vast diseases it can be asymptomatic but can also lead to severe life threatening organ involvement (4). The management of CMV viremia typically entails antiviral medicines together with ganciclovir, however the addition of CMV immunoglobulin has been shown to improve effects (5). The method for deception of CMV is viral NAT PCR (6). In those three patients, the mixture of CMV immunoglobulin and ganciclovir was a success in lowering the CMV load in each patient. The required dose of CMV immunoglobulin was 150mg/kg on day 1, 3 and 7, (7) as we are dwelling in 3rd world country due to financial constraints patients are not able to afford full proper dosage. So we tempered this dose and gave 2.5gm/day on 1st, 3rd and 5th day with total of three doses along with ganciclovir in therapeutic dose for 21 days followed by prophylactic dose of valganciclovir for three months. In our scenario all 3 patients had gastrointestinal involvement, which responded remarkably to the treatment. The suggested treatment regimen showed dramatic differences in CMV load and resolutions of symptoms.

Case number :	**CMV load (pre-treatment)**	**CMV load (post-treatment) after 2 weeks**	**CMV load (post-treatment) after 4 weeks**
Case number 1	98,027 copies	63,000 copies	Negative
Case number 2	936,786 copies	700,000 copies	Negative
Case number 3	750,000 copies	Negative	Negative

CONCLUSION:

The successful management of CMV viremia in these 3 patients highlights the effectiveness of 3 reduced doses of CMV immunoglobulin combined with ganciclovir for 21 days followed by valganciclovir for 3 months. This treatment routine substantially reduced the CMV load in every patient, indicating stepped forward results. Further studies are needed to validate these findings and assess the long-term efficacy of this treatment regimen.

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Conflict of Interest:

The authors declare no conflicts of interest.

Ethical Approval:

Ethical approval was obtained from the institutional review board to publish this case report.

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Case Report

SALT-WASTING CONGENITAL ADRENAL HYPERPLASIA: A CASE REPORT

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ABSTRACT:

Salt-Wasting Congenital Adrenal Hyperplasia (SW-CAH) is a rare genetic disorder characterized by enzyme deficiencies affecting the adrenal steroidogenesis pathway, leading to a decrease in cortisol synthesis. Here presented a case of a 28-day-old male infant presented with symptoms of lethargy and feeding difficulties. Initial evaluations revealed severe electrolyte imbalances, including hyponatremia and hyperkalemia. Further investigations, including hormone tests, confirmed a diagnosis of SW-CAH. The management involved intravenous therapy with steroids, including hydrocortisone and fludrocortisone, to restore hormonal balance. Strict monitoring of sugar levels, blood pressure, serum electrolytes, and cortisol levels was crucial. The case highlights the importance of early diagnosis and intervention, particularly in regions with limited access to healthcare services.

This report underscores the need for increased awareness of CAH, particularly SW-CAH, and the potential benefits of implementing newborn screening programs and establishing effective disease databases to improve early detection and management of this condition, potentially saving lives.

Keywords: Congenital Adrenal Hyperplasia, Hyponatremia, hyperkalemia, Glucocorticoids

INTRODUCTION

Congenital Adrenal Hyperplasia (CAH) is an autosomal recessive condition characterized by enzyme abnormalities that affect the adrenal steroidogenesis pathway, resulting in decreased cortisol synthesis. Depending on the kind and degree of the steroid interference, people may experience glucocorticoid, mineralocorticoid, and sexual corticosteroid modifications in production which necessitate substitute hormone treatment (1). Prolonged excessive stimulation of the adrenal cortex as a result of the activity of an enzyme necessary for cortisone synthesis causes a build-up of antecedents close to the enzyme's inhibited phase. The most prevalent type of CAH is brought on by steroid 21-hydroxylase deficiency resulting from CYP21A2 alterations (2).

Congenital Adrenal Hyperplasia is an autosomal recessive disorder that affects about 1 in 15,000 people and is usually caused by 21-hydroxylase insufficiency (3). Given that CAH is a hereditary biological condition, the larger CAH prevalence may be attributable to greater consanguinity, lesser diversity in genes, or additional genetic variables (such as hotspots for abnormalities). There is scarce data on the disorder, additionally, there are limited testing facilities, exacerbating the matter two-folds. Just by establishing an effective disease database and implementing a newborn screening plan, this issue can be addressed (4).

The prevalence of CAH may be directly impacted by cultural norms about consanguineous unions or isolation from the outside world in some regions. The number of confirmed cases and the actual prevalence of CAH could be impacted by the fact that newborn tests for the disease aren't always accessible in numerous impoverished nations (5).

Case Presentation

A 28-day-old male baby was brought to the emergency department with complaints of being reluctant to feed and being lethargic for two days. Initially, the baby was managed in another private hospital for the correction of serum electrolytes

The baby was afebrile and had no sign of respiratory distress. The chest was clear on examination with no added sounds, and the cardiovascular and central nervous system was intact. The abdomen was soft and no tenderness was observed. The gut sounds were audible.

In the emergency department, serum electrolytes were repeated which showed serum magnesium of 2.4mg/dl, blood urea nitrogen 35mg/dl, serum creatinine 1mg/dl, serum sodium 118/dl and serum potassium of 9.3mg/dl. The patient showed hyponatremia and hyperkalemia. The initial management in the emergency department was intravenous fluids, calcium gluconate, salbutamol nebulization, Insulin and dextrose cocktail and K-oxalate to treat hyponatremia and hyperkalemia.

For further workup, the Adrenocorticotropic hormone, 17 OH progesterone level, Serum cortisol, and renin level were sent to the laboratory for further investigation. 25mg hydrocortisone was given after taking the laboratory samples. The emergency department suspected it was Salt-Wasting Congenital Adrenal Hyperplasia with hyperkalemia. For further management, the baby was then moved to the neonatology unit.

The laboratory profile of the hormones is given below in the Table 1.

S. No	Tests	Range	Results
1	Neonatal TSH	1.3 to 16uIU/ml	0.38 uIU/ml
2	17 OH progesterone	<100	>320 ng/ml
3	Cortisol	5 to 25	10.3 ug/dl
4	ACTH	112- 128	353 pg/ml
5	Renin	2.8- 39.9	>500 uIU/ml
6	Aldosterone	6 to 179ng/dl	84.2ng/dl

In the neonatology unit, the serum electrolytes were repeated which showed sodium 129, potassium 4.3, chloride 96 and urine and blood were sent for culture and sensitivity in which no growth was found. The medical management includes 5% dextrose at the rate of 15ml/hour, intravenous antibiotics cefotaxime 125mg every 8 hourly, injection of hydrocortisone 2mg every 6 hourly and injection of fludrocortisone acetate 0.1mg every 12 hourly.

The baby's condition improved with the management of intravenous steroid therapy. The baby was active and was able to take feed. The baby was discharged and was kept on steroids and the diagnosis was confirmed as Salt- Wasting Congenital Adrenal Hyperplasia.

DISCUSSION

Salt-Wasting Congenital Adrenal Hyperplasia is a rare disease with an uneven ratio of males and females. It additionally brought down the unequal gender proportion, having more females being diagnosed versus males, implying that before screening, certain males had possibly gone undiagnosed and died (6). The critical point is that male babies are usually undiagnosed at the initial visits. Aldosterone production is typically markedly impaired for those with salt-wasting congenital adrenal hyperplasia, necessitating the replenishment of mineralocorticoids as well. The increased production of ACTH levels in the blood causes hyperplasia of the adrenal gland because they are signaling the adrenal gland to produce the cortisol and other hormones which they are unable to produce. Salt wasting occurs due to the low level of aldosterone in the blood.

There is not much research on mineralocorticoid replacement, even though glucocorticoid therapy in SW-CAH is widely used to substitute lost glucocorticoids and manage excessive adrenal androgen (7). The Laboratory findings showed hyponatremia, hypoglycemia, and hyperkalemia with augmented renin activity,

increased adrenocorticotropic hormone (ACTH), low aldosterone, low cortisol, and high 17 OH progesterone levels. Literature also says that the salt-losing variety of 21 hydroxylase deficiency is thought to be the most prevalent and dangerous variant, with almost no glucocorticoid synthesis and reduced aldosterone production that causes salt loss, inability to flourish, and possibly deadly low blood pressure and shock (8).

There should be strict monitoring of sugar levels, blood pressure, serum electrolytes and cortisol levels in these patients. In this scenario, the baby was lethargic due to low sugar, low blood pressure and cortisol levels in the blood. To maintain the sugar level, 5% dextrose was continued at the rate of 15ml/hr. Injection hydrocortisone was prescribed to maintain the cortisol level in the body and fludrocortisone 0.1mg was given to maintain the sodium level in the body. Additionally, according to the literature, the infant has to begin substituting medication with steroids and sodium therapy (hydrocortisone and fludrocortisone), which will have a dramatic impact on their gradual physical and cognitive growth (9). The baby was discharged on oral hydrocortisone and fludrocortisone with regular follow-up and serum electrolytes, sugar and blood pressure monitoring.

CONCLUSION

Congenital Adrenal Hyperplasia is a rare autosomal recessive disorder characterized by enzyme deficiencies that affect the adrenal steroidogenesis pathway, leading to decreased cortisol synthesis. This can result in various hormonal imbalances and necessitate hormone replacement therapy. In our case, the baby was presented with hyponatremia and hyperkalemia. The hormone, 17 OH progesterone, cortisol and aldosterone were also abnormal. Glucocorticoid and mineralocorticoid therapy was started for the baby. Literature also says that SW-CAH is a severe form of CAH characterized by impaired aldosterone and cortisol production, leading to salt wasting. Treatment for SW-CAH involves hormone replacement therapy with steroids (hydrocortisone) and mineralocorticoids (fludrocortisone) to restore hormonal and electrolyte balance. Strict monitoring of sugar levels, blood pressure, serum electrolytes, and cortisol levels is essential for managing such patients.

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