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Emphasize the new and important aspects of the study and the conclusion that follow from them. The detail data or other material given in the Introduction or the results section should

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EDITORIAL

Gut Microbiota: The Hidden Organ

Professor Dr. A. H. S. M. Kamruzzaman

Tens of trillions of microorganisms resides in the human intestine are regarded as gut microbiota. The neonatal intestinal tract is rapidly colonized by bacteria from the mother and surrounding environment following birth. Of course, the delivery method—natural versus caesarean section—is a strong determinant of the first real microbial colonizers of the neonatal intestinal tract [1]. Numerous publications have described clear differences in the gut microbiota composition between babies born via caesarean section versus natural birth [2] and for breast-fed versus formula-fed babies [3]. The gut microbiota continues to develop throughout childhood and adolescence and becomes more stable as it is generally assumed that the gut microbiota after around 3 years of age closely resembles that of an adult [3].

It is difficult to culture gut microbiota in vitro because they grow in a highly anerobic environment. It is only over the last few decades with the emergence of culture-independent sequencing technologies that we have gained such a vast insight into the compositional changes that exist between individuals in both healthy and diseased states. Germ free animals have highlighted the importance of a gut microbiota in influencing many aspects of host biology, including metabolism, social development, and immunity [4]. Germ free animals show defects in both the development of the immune system and in immune responses. They show extensive defects in the development of gut-associated lymphoid tissue and cell-turnover rates of intestinal epithelial cells and have fewer and smaller Peyer's patches and mesenteric lymph nodes compared with animals housed under specific pathogen-free (SPF) conditions [5].

With the help of culture-independent analyses, our understanding of gut microbiota composition and germfree studies have helped determine the role of gut microbes in health. Recent literature has linked gut microbiota composition with almost every disease known to man, from GI diseases [6], to obesity [7], diabetes [8], cancer [9] and even neurological and neurodegenerative disorders such as depression [10], autism [11], anxiety [12] and Parkinson's disease [13].

Dietary patterns are associated with distinct combinations of bacteria in the intestine, also called enterotypes [14]. The difficulty arises in deciphering which precise dietary constituents specifically promote the growth of health beneficial gut microbiota that maximize the production of pharmabiotics. Thus, the identification of dietary patterns or specific foods that increase bacterial diversity and promote the growth of beneficial bacteria that produce high levels of bioactive metabolites, is the ultimate research goal. Diets rich in saturated fat (lard) are associated with increased white adipose tissue inflammation and metabolic disease, while diets rich in polyunsaturated fatty acids (fish oil) can counteract inflammation to promote a lean and metabolically healthy phenotype [14].

It is well known that, genetic factor is an

important determinant of health apart from environmental and dietary factor. Diet is a predominant environmental factor over host genetics in shaping gut microbiota composition. But it is often very difficult to determine the extent by which dietary factors affect gut microbiota apart from genetic factors. Therefore we should take regular healthy, low fat diet to improve gut microbiota and thus make a good immune system and immune response.

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Original Article

Correlation of Result of Rapid Antigen Test with that of RT-PCR for SARS-COVID-19-2: a Pilot Study

Quazi Arif Ahmed[1], Mohammad Shiblee Zaman[2], Md. Asaduzzaman[3], Md. Mokarram Hossain[4], Farhana Hossain[5], Manosh Kumar Mondal[6], Kallyanashish Sardar[7], Debprosad Adhikary[8], Md. Salman Hossain[9]

Abstract

Background: The coronavirus disease 2019 (COVID-19) pandemic continues to spread across the world. Therefore, there is an urgent need for rapid, simple, and accurate tests to diagnose severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Performance characteristics of the rapid SARS-CoV-2 antigen detection test should be evaluated and compared with the gold standard real-time reverse transcription-polymerase chain reaction (RT-PCR) test for diagnosis of COVID-19 cases. **Methods:** The rapid SARS-CoV-2 antigen detection test, Panbio™ COVID-19 RAD (Abbot Diagnostics Jena GmbH), was compared with the real-time RT-PCR test, Sansure Biotech™ COVID-19 Ag kit (Belgium) for detection of SARS-CoV-2. One hundred and ten nasopharyngeal samples were obtained from COVID-19 suspected cases, at Satkhira Medical College Hospital, Satkhira, Bangladesh and some private hospitals of Satkhira District of Bangladesh during the period of December 2021 to March 2022. In the samples both RT-PCR and rapid antigen testing was done. **Results:** Mean age of the patients were 47.5 ± 19.94 years with male to female ratio 1: 1.4. Of 110 samples, 75 (68.18%) were positive, and 35 (31.81%) were negative for SARS-CoV-2 RNA by RT-PCR assay. Of the 75 RT-PCR positive samples only 1 (2.85%) was negative in rapid antigen testing which reflected significant positive correlation with an r value of 0.63 and a *p* value of 0.001 by Spearman correlation testing. **Conclusion:** Rapid antigen testing significantly correlates with RT PCR test and can be done for detection of COVID 19 which is easy, reliable and cost effective.

Keywords: Rapid antigen test, RT PCR, COVID-19.

Introduction

COVID-19 is officially declared a global pandemic on March 11, 2020 by World Health Organization [1]. It is caused by SARS-CoV-2 and represents a great challenge to health-care systems as it is a rapidly spreading and highly fatal disease. It is caused by SARS-CoV-2 which represent a great challenge to health-care systems as it is a rapid spreading and highly fatal disease. After a rapid spread in China, new outbreaks have occurred in Italy and in several European countries, followed by

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a spread to many countries in the world. The disease is primarily transmitted through large respiratory droplets and represents from asymptomatic or mild infection to severe form of disease [2]. Studies have shown that the clinical feature of COVID-19 may vary from fever, dry cough, dyspnea, and fatigue in mild cases to viral pneumonia and severe acute respiratory distress syndrome (ARDS) in more aggressive cases. It may even cause death [3].

According to the COVID-19 dashboard on August 31st, 2020 by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University, over 25 million people in more than 200 countries have been infected and more than 840,000 was killed [4-6]. It is expected that these numbers will continue to rise, especially in populous countries such as the United States, Brazil, and India. SARS-CoV-2 infection causes asymptomatic and mild diseases more than severe pneumonia. Severe cases may develop acute respiratory distress syndrome (ARDS) and death with an average mortality rate of 6% (range 1–14.4%) [7]. Rapid and prompt diagnosis may reduce the mortality rate. Therefore, search for a convenient and rapid method is always expected since the pandemic started.

Identification of people infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is an essential prerequisite for controlling the pandemic spreading. Reverse transcriptase-polymerase chain reaction (RT-PCR) molecular represents the gold standard for the diagnosis of viral infection, it is very sensitive and accurate and remains the reference method for diagnosing coronavirus disease 2019. However, nucleotide-based testing of viral RNA is expensive and time-consuming and requires specialized laboratory settings. The real-time reverse transcription-polymerase chain reaction (RT-PCR) assay, which is the current gold standard test for laboratory diagnosis of SARS-CoV-2 infection, requires at least four hours of operation performed by skilled technicians. Sometimes laboratories wait for samples for convenience in developed countries like Bangladesh. Therefore, rapid and accurate tests for SARS-CoV-2 screening are essential to expedite disease prevention and control, as well as screening during pre-operative management for invasive procedures [8]. But rapid antigen testing is not regarded as a standard method for the detection of COVID-19 due to lack of correlation studies. Therefore, we have done a pilot study on correlation between the results of RT PCR and rapid antigen testing for the detection of COVID-19.

Coronavirus rapid antigen detection (RAD) tests, with the appropriate application in the context of the pandemic, may contribute to the overall diagnostic capacity, offering benefits in terms of response times, and costs for the healthcare system, especially in situations in which the possibility of performing a molecular test from nasopharyngeal swab could be limited [9]. The use of rapid antigen test can be recommended to test people, regardless of symptoms, when a high positive percentage is expected, for example, which approximates or exceed 10% [10, 11]. Despite the lower sensitivity (Sn) when compared with the molecular assays, the RAD is a highly valuable test in terms of surveillance, to track and prevent the spread of infection [10]. The antigen (Ag) tests, based on the immunochromatographic principle, essentially detect SARS CoV-2 nucleocapsid protein (N), they are performed at or near the place where the specimen will be collected, and they provide rapid results within few minutes. However, due to the different methods applied, rapid antigen detection test tends

more prone to false-negative result, therefore every suspected case must be confirmed by a molecular test.

Clinical specimen

Respiratory samples, mainly nasopharyngeal and throat swabs, were collected from 110 suspected COVID-19 cases. Samples were transported at 2–8°C to the microbiology laboratory of Satkhira Medical College Hospital for processing within a few hours. All specimens were processed in biosafety level-2 enhanced (BSL-2 +) facilities with full personal protective equipment. Rapid antigen testing is also done in the same specimen.

Laboratory methods

After extraction of viral RNA SARS-CoV-2 RNA detection was done using real-time RT-PCR. Sansure Biotech™ COVID-19 Ag kit (Belgium) was used for detection of SARS-CoV-2. Briefly, 8 µL of extracted RNA was added to 5 µL of 5X Real-time One-step Buffer, 5 µL of 2019-nCoV MuDT Oligo Mix (2019-nCoV-MOM), 2 µL of Real-time One-step Enzyme, and 5 µL of RNase free water. The CFX-96 real-time thermal cycler (Bio-Rad Laboratories, Inc., Hercules, CA, USA) was used for amplification. The conditions consisted of 1 cycle of 20 min at 50°C, 1 min at 95°C and followed by 45 cycles of 15 s at 94°C, 30 s at 58°C. The result was analysed using Seegene Viewer (Seegene, Korea), in which a cycle threshold value (CT-value) <40 for all three target genes was defined as a positive result.

In the same sample rapid antigen testing was done using Panbio™ COVID-19 Ag rapid test device (by Abbott). This rapid antigen test device had two pre-coated lines on the result window: control (C) and test (T) lines. The control (C) region was coated with mouse monoclonal anti-chicken Igy antibody; the test (T) region was coated with mouse monoclonal anti-SARS-CoV-2 antibody against SARS-CoV-2 N antigen. Detectors for SARS-CoV-2 N antigen presented in the specimen were mouse monoclonal anti-SARS-CoV-2 antibody conjugated with color particles. The antigen–antibody color particle complex migrates via capillary force and was captured by the mouse monoclonal anti-SARS-CoV-2 antibody coated on the test (T) region. The colored test (T) line's intensity depended on the amount of SARS-CoV-2 antigen presented in the sample.

Figure 1 & 2: CFX-96 real-time thermal cycler (Bio-Rad Laboratories, Inc., Hercules, CA, USA) and Panbio™ COVID-19 Ag rapid test device (by Abbott).

Methods

It was a prospective analytic study done in Satkhira Medical College Hospital and some private clinics of Satkhira District of Bangladesh. The study was done between the periods of December 2021 to March 2022. Suspected COVID-19 patients were the study subjects. After proper counselling and taking informed written consent samples were taken from them. The samples were nasopharyngeal swab. RT PCR and rapid antigen testing was done in the same sample. Our research question was: whether there was any correlation of results of rapid Ag test with that of RT-PCR for SARS-CoV 2? Data analysis was done by SPSS and any correlation between the results of RT PCR and that of rapid antigen was searched.

Results

Demographic characteristics of the study subjects were given in table 1 which shows that, mean age of the patients were 47.5 ± 19.94 years with male to female ratio 1: 1.4.

Table 1: Demographic characteristics of the study subjects (n = 110).

Variables	Values
Age (years) (Mean ± SD)	47.5 ± 19.94
Male to female ratio	1:1.4

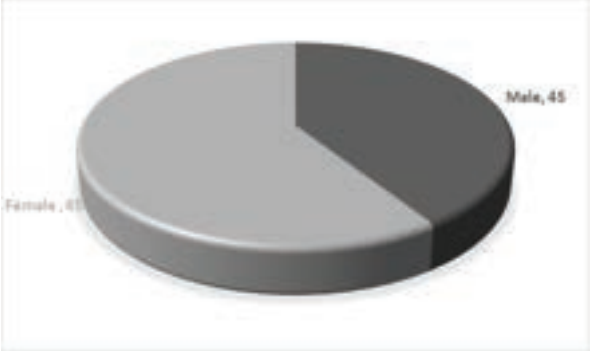

Figure 3: Sex distribution of the study subjects.

Table 2: Comparison between the results of RT PCR with that of Rapid Antigen Testing (n = 110).

Diagnostic test result	Frequency n (%)
RT PCR +ve	75 (68.18)
Rapid antigen +ve	100 (90.9)
Both RT PCR & Rapid antigen +ve	74 (67.27)
RT PCR +ve but Rapid antigen -ve	01 (2.85)

Of the 75 RT-PCR positive samples only 1 (2.85%) is negative in rapid antigen testing which reflects significant positive correlation with an r value of 0.63 and a *p* value of 0.001 by Spearman correlation testing.

Discussion

Molecular tests are the standard laboratory diagnosis to confirm SARS-CoV-2 infection; RT-PCR assays for SARS-CoV-2 RNA detection in clinical specimens are widely used in COVID-19 diagnostic laboratories. Since the start of the SARS-CoV-2 pandemic, the diagnostic ability to detect infected people in shortest period of time has been crucial for the management of viral infection. Rapid antigen detection tests have significantly reduced delays in the test results, allowing a more rapid decision for clinical intervention and preventive measures, but they are not without potential risks regarding diagnostic test accuracy [12].

Rapid antigen immunoassays with equivalent sensitivity and specificity to real-time RT-PCR assays will help speed up disease screening. Chaimayo et al. (2020) in their study found the rapid SARS-CoV-2 antigen detection test's sensitivity and specificity were 98.33% (95% CI, 91.06–99.96%) and 98.73% (95% CI, 97.06–99.59%), respectively [13].

In the present study, we have evaluated the diagnostic performance of Panbio™ COVID-19 Ag Rapid Test with routine RT-PCRs analyzing different SARS-CoV-2 genes, in a cohort of 110 suspected subjects. We did a prospective analytic study in Satkhira Medical College Hospital and some private clinics of Satkhira District of Bangladesh. The study was done between the periods of December 2021 to March 2022. Suspected COVID-19 patients were the study subjects. After proper counselling and taking informed written consent samples were taken from them. The samples were nasopharyngeal swab. RT PCR and rapid antigen testing is done in the same specimen. The mean age of the patients were 47.5 ± 19.94 years with male to female ratio 1: 1.4. After doing statistical analysis we found a significant positive correlation with the results of rapid antigen test with that of RT PCR with an r value of 0.63 and a p value of 0.001 by doing Spearman correlation test. We could not do sensitivity, specificity test because we had categorical data. None the less, a significant positive correlation may reflect the importance and acceptance of rapid antigen test.

Conclusion

From the study it could be concluded that, rapid antigen testing significantly correlates with RT PCR test and can be done for detection of COVID 19 which is easy, reliable and cost effective.

Limitation of the Study

The main limitation of the study is its short sample size and lack of quantitative data.

Conflict of Interests

The authors declare that there are no conflict of interests.

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Original Article

Comparison of Regional Block versus General Anesthesia for Cesarean Section and Neonatal Outcome

Md. Saifullah[1], Sankar Prosad Biswas[2], Md. Shamsur Rahman[3], GM Faruquzzaman[4], Md. Moniruzzaman[5], Ranjeet Kumar Mondal[6]

Abstract

Background: Guidelines of anesthesia recommend regional anesthesia for most caesarean sections (CS) due to the risk of failed intubation and aspiration with general anesthesia. However, general anesthesia (GA) is considered to be safe for the fetus, based on limited evidence, and is still used for caesarean sections. **Aims:** To compare maternal and fetal outcomes in women undergoing emergent CS with spinal anesthesia (SA) versus GA. **Materials and Methods:** This study took place at department of Anesthesiology of Satkhira Medical College Hospital, Satkhira, Bangladesh, during January 2021 to December 2021. It included 400 patients who had emergency CS and were subdivided equally into two groups according to the appropriate clinical indications. Group GA: Received rapid sequence general anesthesia and Group SA: Received spinal anesthesia. Patient features, CS indication, decision-to-delivery interval (DDI), uterine incision-to delivery (UIDT), cord blood pH, APGAR scores, length of hospital stay (LOS) and maternal morbidity have been noted. **Results:** The DDI and UIDT were not significantly different. One and 5-min APGAR scores were significantly (p<0.05) higher in SA group compared to GA group. The umbilical cord blood pH showed no difference. No differences were noted between both groups regarding neonatal and maternal morbidity postoperatively. **Conclusion:** GA may be considered the fastest anesthesia procedure in emergency situations, as it eliminates the risk of a failed regional block. In the meantime, the danger to mother or fetus is higher. Thus, we recommend regional anesthesia wherever possible due to better outcome regarding APGAR score and LOS.

Keywords: Emergency cesarean sections, APGAR score, spinal & general anesthesia.

Introduction

Globally, there is an increasing proportion of women giving birth by cesarean delivery in both developed and developing countries which is either done by the woman's request or as a result of complications [1].

Data from National Health Service (NHS) hospitals in England from 2018 to 2019 show that spontaneous vertex delivery is the most common mode of delivery (57%), followed by emergency caesarean delivery (17%), elective caesarean delivery (13%) and operative vaginal delivery (13%) [2].

It has been reported by Little et al. (2016) [3] that the USA has a higher rate of cesarean delivery around 65%. An essential step in the

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choice of anesthetic technique for cesarean delivery is the safety and health benefits to the mother and fetus. With the advancement of anesthesia techniques, operations have become safer and secured over the years, but significant maternal and fetal mortality and morbidity do exist [4]. Anesthesia for cesarean delivery can be achieved either through general anesthesia (GA) or regional anesthesia (RA) such as spinal anesthesia (SA), epidural anesthesia (EA), or combined spinal-epidural anesthesia (CSE).

Pain during labor and delivery is common. Pain after caesarean delivery is a primary concern for women. Postpartum pain constitutes an important domain of postpartum recovery following all modes of delivery [5]. Optimizing postpartum analgesia is a key strategy of enhanced recovery protocols [6, 7], as it improves recovery through facilitating earlier mobilization, enhancing maternal-neonatal bonding and reducing hospital length of stay [8].

Nowadays, the 30-minutes decision-to-delivery interval (DDI) is the standard in current practice for women needing an immediate caesarean section [9]. However, time limitation and high risk make both maternal and fetal outcomes rely on the anesthetist's coordination diligence and the proper choice of anesthetic technique is of fundamental importance [10]. Though several randomized trials have compared the maternal and fetal outcome between these two anesthetic techniques. This study hypothesized that SA can be superior to GA in terms of maternal and neonatal outcome for cesarean section. Hence, this prospective observational study has been designed to study the effect of anesthetic technique on the maternal and fetal outcomes in cesarean section.

Materials and Methods

This prospective non-randomized clinical trial was carried out in 400 pregnant women admitted for urgent cesarean sections (CS) were included in this study. The study was done in the department of Gynae and Obstetrics, under supervision of Department of Anesthesiology of Satkhira Medical College Hospital, Satkhira, Bangladesh, during January 2021 to December 2021. American Society of Anesthesiologists physical status (ASA) < III, age belonged to 18–40 years, gestational age more than 37 weeks, emergency cesarean delivery and singleton pregnancy were enrolled in this study. Twin pregnancy, neurological impairment, congenital fetal abnormality, body mass index more than 40 kg/m², sensitivity to medications used during the emergency CS and disagreed to participate in the study were excluded from the study. All the patients were properly explained about the objectives of the study along with its procedure, risk and benefits to be derived from the study in easily understandable local language and then informed consent was taken from them. After obtaining written informed consent from each patients, they were equally allocated into two groups. **Group GA:** Received rapid sequence general anesthesia (n=200), and **Group SA:** Received spinal anesthesia (n=200). It was assured that all records would be kept confidential and would not be disclosed anyway except for the purpose of study. It was assured that the procedure was helpful for both the physician and patients in making rational approach regarding management of the case. All findings were collected in a pre-designed data collection sheet.

Before induction of anesthesia intravenous (IV) ranitidine 50 mg was administered after establishing an IV access. On the operating table, hemodynamic parameters (ECG, noninvasive

blood pressure and hemoglobin oxygen saturation) were monitored for all patients throughout the surgery according to the standard departmental protocol.

Study Procedure

For general anesthesia: Patients were positioned with pelvic wedge. They were then pre-oxygenated with four vital capacity breaths as the patients' abdomen was cleaned and draped. Then rapid sequence induction with pre-calculated doses of propofol and rocuronium (2 mg/kg & 0.9 mg/kg, respectively) was followed by endotracheal intubation. After delivery of the baby, fentanyl was administered. Later, anesthesia was maintained with isoflurane (1.0%).

For spinal anesthesia: All patients were pre-loaded with 500 mL of crystalloid solution. In the left lateral position, the patients' back was cleaned with povidone iodine. In the meantime, the spinal anesthetic drug and local anesthetic drug were prepared. After wiping povidone iodine with alcohol, a single rapid shot of 2.2 mL of 0.5% hyperbaric bupivacaine was administered intrathecally using 22 G spinal needle. Later, the patients were kept in supine position with pelvic wedge. Oxygen was administered using simple face mask till the delivery of the baby.

Intra-operatively, all patients were administered Ringer's lactate. Blood pressure was recorded at 5-min intervals. Any blood pressure less than 20% of baseline was treated with boluses of 5 mg of ephedrine.

The primary outcome in present study was to evaluate the neonatal APGAR score at 5 minutes. All other data were reported as secondary outcomes including: demographics; decision-to-delivery interval (DDI); time of anesthetic induction (time from start of anesthesia till induction complete by confirmation of endotracheal intubation in GA or adequate level of block to touch in SA); uterine incision-to-delivery time (UIDT); intraoperative heart rate; intraoperative mean arterial pressure; APGAR score at 1 min and umbilical cord blood sample which assessed by a neonatologist. Neonatal intensive care unit admission (NICU) was also recorded.

Postoperatively, all patients were followed for any postoperative complications, intensive care unit (ICU) admission and length of hospital stay (LOS).

Statistical Analysis

All statistical calculations were done using SPSS 22.0 for Windows (IBM SPSS Statistics. 22.0). Any value <0.05 is regarded as statistically significant.

Results

A total of 400 patients were included in the study, 200 allocated to general anesthesia group (G) and 200 allocated to spinal anesthesia group (S). More than half (58.0%) of patients belonged to age 21-25 years in GA and 124 (62.0%) in SA. The mean age was 24.2 ± 3.9 years in GA and 23.6 ± 3.1 years in SA. The mean BMI was 26.1 ± 3.3 kg/m² in GA and 26.5 ± 3.7 kg/m² in SA. Majority (79.5%) patients had found ASA I in GA and 158 (79.0%) in SA. More than three fourth (76.0%) of patients belonged to gestational age 37-40 weeks (Term) in GA and 160 (80.0%) in SA. Nearly one fourth (24.0%) of patients were postdated pregnancy in GA and 40 (20.0%) in SA. The differences was not statistically significant ($p>0.05$) between two groups. There were no significant differences between the studied groups regarding indication of cesarean section as well as duration of surgery and duration of anesthesia (Table 1 and 2). There were statistically significant ($p<0.05$) differences

between study groups as regards to APGAR score at 1 minute and 5 minute with high mean among spinal anesthesia group. Although umbilical cord PH showed higher values in group S but it was still insignificant (Table 3). Complications did not differ significantly (p>0.05) between studied groups. However, the LOS was significantly (p<0.05) lower in S group. There were ten mothers had to be admitted to the critical care unit (CCU) postoperatively. Four patients had premature rupture of membranes (PROM) and sepsis and they were on mechanical ventilation for 2-3 days; three had diabetic ketoacidosis and other three had eclamptic fits postoperatively. The CCU admission was because of their preexisting comorbidity and not due to any adverse event during anesthesia and surgery. There was no maternal mortality (Table 4).

Table 1: Indication of cesarean section in both groups.

Indication	General Anesthesia (n=200) Mean ± SD	Spinal Anesthesia (n=200) Mean ± SD	*p* value
Fetal bradycardia	73 (36.5)	55 (27.5)	0.053^{ns}
Meconium stained liquor	40 (20)	43 (21.5)	0.711^{ns}
Abruptio placenta	24 (12)	18 (9)	0.327^{ns}
Placenta Previa	16 (8)	11 (5.5)	0.319^{ns}
Preeclampsia/eclampsia	14 (7)	19 (9.5)	0.363^{ns}
Failed instrumental delivery	10 (5)	20 (10)	0.057^{ns}
Rupture uterus	9 (4.5)	3 (1.5)	0.078^{ns}
Cord prolapse	8 (4)	2 (1)	0.054^{ns}

ns=not significant; p value reached from chi square test.

Table 2: Duration of surgery & anesthesia in both groups.

Duration	General Anesthesia (n=200) Mean ± SD	Spinal Anesthesia (n=200) Mean ± SD	*p* value
Induction of anesthesia (min)	8.4 ± 2.5	8.8 ± 2.4	0.103^{ns}
Decision-to-delivery interval (min)	23.7 ± 5.9	24.6 ± 4.7	0.092^{ns}
Uterine incision-to delivery (sec)	64.2 ± 21.1	67.9 ± 21.2	0.081^{ns}
Duration of operation (min)	59.3 ± 12.6	61.4 ± 13.8	0.112^{ns}

s=significant; ns=not significant; p value reached from unpaired t-test.

Table 3: Comparison between the studied groups regarding neonatal data.

Neonatal Data	General Anesthesia (n=200) Mean ± SD	Spinal Anesthesia (n=200) Mean ± SD	*p* value
APGAR score at 1 min	6.5 ± 1.5	7.6 ± 1.2	^{a}0.001^{s}
APGAR score at 5 min	8.7 ± 1.2	9.2 ± 0.9	^{a}0.001^{s}
Umbilical cord PH	7.19 ± 0.06	7.22 ± 0.05	^{a}0.001^{s}
NICU admission	19 (9.5%)	13 (6.5%)	^{b}0.268^{ns}

s=significant; ns=not significant; a=*p* value reached from unpaired t-test; b=*p* value from chi square test.

Table 4: Maternal complications in both groups.

Maternal complications	General Anesthesia (n=200) n (%)	Spinal Anesthesia (n=200) n (%)	*p* value
PONV	24 (12)	14 (7)	[a]0.088[ns]
Hypertension	14 (7)	7 (3.5)	[a]0.116[ns]
Fever/sepsis	5 (2.5)	6 (3)	[a]0.759[ns]
Back pain	2 (1)	8 (4)	[a]0.054[ns]
Headache	1 (0.5)	6 (3)	[a]0.566[ns]
Convulsions	10 (5)	6 (3)	[a]0.307[ns]
ICU admission	6 (3)	4 (2)	[a]0.521[ns]
LOS (days) (Mean ± SD)	2.1 ± 0.6	1.6 ± 0.5	[b]0.001[s]

s= significant, ns= not significant; a= *p* value reached from chi square test; b=*p* value from unpaired t-test, PONV = Post-Operative Nausea & Vomiting, LOS = Length of Hospital Stay.

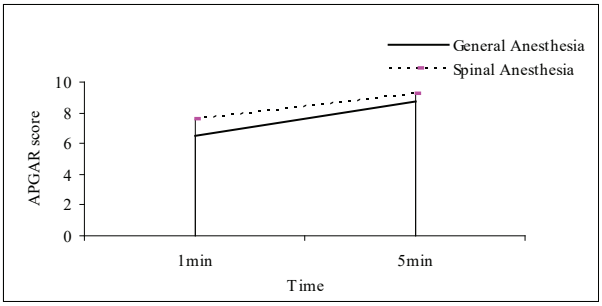

Figure 1: APGAR score at 1 and 5 minutes in general and spinal anesthesia groups.

Discussion

Although the constant increase in the rate of caesarean delivery still has a higher maternal and neonatal morbidity and mortality correlated not only with surgical abilities but also with the anesthesia used mentioned by Kolas et al (2006) [11]. Although the current practice is shifted toward spinal anesthesia, there is still no single perfect surgical or anesthetic procedure to be used in the C-section [12].

During GA, it may not be always possible to maintain a discrete balance between the MAC to prevent awareness in the mother and to prevent neonatal depression in an already compromised fetus. However, the anesthesiologists invariably will try to maintain adequate anesthetic depth in the mother which may lead to the placental transfer of anesthetic drugs (opioids, induction agents and inhalational agents), thereby influencing the neonatal outcome [13]. The feto-maternal ratios of anesthetic agents suggest minimal transfer across the placenta; however, in CS when the fetus is already compromised, it may be enough to cause neonatal depression [14].

This study suggested that patients receiving GA for emergency cesarean sections (CS) had significantly low APGAR scores at 1 and 5-min compared with patients receiving SA. Thangaswamy et al. [15] study also observed that GA for emergency cesarean sections was found to be associated with low APGAR score at 1 and 5 min. Beckmann et al. [14] had done a retrospective cohort study on 533 term babies observed that babies born by emergency cesarean sections (CS) GA were significantly more likely to score APGAR < 7 at 5 min. Algert et al. [10] stated that in infants needed intubation, a 5-min APGAR score of less than 7 was more frequent in delivery with general anesthesia than delivery with regional anesthesia. Many other studies Shek et al. [16], Anaesthesiology et al. [17] and Chattopadhyay et al. [18] have also reported that APGAR scores were significantly lower in neonates whose mothers received GA.

This study suggested that patients receiving GA for emergency cesarean sections (CS) had significantly low APGAR scores at 1 and 5-min compared with patients receiving SA. Thangaswamy et al. [15] study also observed that GA for emergency cesarean sections was found to be associated with low APGAR score at 1 and 5 min. Beckmann et al. [14] had done a retrospective cohort study on 533 term babies observed that babies born by emergency cesarean sections (CS) GA were significantly more likely to score APGAR < 7 at 5 min. Algert et al. [10] stated that in infants needed intubation, a 5-min APGAR score of less than 7 was more frequent in delivery with general anesthesia than delivery with regional anesthesia. Many other studies Shek et al. [16], Anaesthesiology et al. [17] and Chattopadhyay et al. [18] have also reported that APGAR scores were significantly lower in neonates whose mothers received GA.

On the other hand, Edipoglu et al. [19] analyzed the outcomes of emergency caesarean sections and found reduced 1 min APGAR scores not reflected in 5-min APGAR scores or morbidity for regional anesthesia group. This variations may be due to patient selection strategies, as the present study excluded pregnancies with suspected fetal abnormality thus reducing the risk for adverse events. Further studies had reported no variations between cases of general and regional anesthesia in the 1-min and 5-min APGAR scores [20].

Others neonatal parameters like as cord blood pH, NICU admission and neonatal mortality were almost comparable between two anesthetic techniques. Numerous studies have assessed the status of neonatal acid-base and its association with the anesthesia technique. Another study Strouch et al. [21] had done on 647 cases with emergency caesarean section found that umbilical blood (pH=7.16) was significantly (p<0.05) lower in general anesthesia compared to spinal anesthesia (pH =7.24). This study observed a similar pattern in umbilical blood pH, with lower pH values in general anesthesia group (7.19) compared to (7.22) in spinal anesthesia group, but the difference was not statistically significant (p> 0.05). Thangaswamy et al. [15] showed that umbilical cord blood pH was comparable between SA and GA for emergency CS. Similar observations also observed by Shek et al. [16] and Edipoglu et al. [19].

The Decision-to-delivery interval time is controversial; however, it is universally accepted to keep DDI within 30 min. The decision-to-delivery interval in both SA and GA was comparable in this present study, whereas Beckmann et al. [14] study observed a significantly (p<0.05) shorter decision-to-delivery interval in patients who received GA.

The length of postoperative hospital stay was significantly (p<0.05) prolonged in Group GA when compared to Group SA, which is which is closely resembled with Havas et al. [22] study, where the authors reported a decrease in postoperative hospital stay after neuraxial anesthesia.

This study has some limitations include unable to do randomization as we followed the medical indications required for emergency caesareans under the departmental protocol. However, this bias was possibly ruled out as DDI was comparable in both groups.

Conclusion

In emergency caesareans suggested for fetal distress, this study found that no anesthetic technique was superior regarding fetal distress. But regarding LOS, APGAR and morbidity, the present study recommend regional anesthesia whenever possible. The adequacy

and the safety of spinal anesthesia as an alternative to general anesthesia in emergency caesareans section needs to be clarified in further larger randomized trials.

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Original Article

A Study on Laparoscopic Cholecystectomy in Acute Cholecystitis: Experience in a District Level Hospital

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Abstract

Background: One of the important cause of acute abdomen is acute cholecystitis which needs emergency hospitalization. Traditionally, these patients were treated conservatively, followed by delayed surgery six weeks or longer after acute event has subsided. Recently, early emergency cholecystectomy at same admission is suggested. This has the advantage of reduced length of stay (LOS) as well as readmission in hospital without any significant increase in complication rate. **Methods:** It was an observational study done between the periods of January 2015 to January 2021. Three hundred and twenty patients who admitted in Satkhira District Hospital, Satkhira Medical College Hospital and different private clinic of Satkhira District with acute abdomen and diagnosed as acute cholecystitis were the study subjects. We planned early laparoscopic cholecystectomy (ELC) in all case, as soon as assessment and resuscitation were completed. Cases were analyzed for gender, age, operation time, volume of blood loss, conversion to open surgery, post-operative complication and length of hospital stay. **Results:** Among the 320 patients, 300 patients were treated with emergency or urgent laparoscopic cholecystectomy (LC). Complications were minimum and length of stay (LOS) in hospital were short (mean-2 days, range: 20 hours-9 days) except those with bile leak (5, 8 and 9 days respectively). None of the cases had bile duct injury or uncontrolled bleeding. There were no mortality. **Conclusion:** Early laparoscopic cholecystectomy (ELC) has proved to be an effective and safe day case surgical procedure for acute cholecystitis and their complications. It provides much benefits with low complication and conversion in experienced hands.

Keywords: Laparoscopic cholecystectomy (LC), early laparoscopic cholecystectomy (ELC), Delayed laparoscopic cholecystectomy (DLC), acute cholecystitis (AC), Length of stay (LOS).

Introduction

The patients of acute cholecystitis are commonly treated initially non-operatively followed by delayed surgery six weeks or longer after acute event has subsided [1]. Recently, there has been significant paradigm shifts in management of such cases to early surgery at same admission with the advantage of reduced length of stay (LOS) in hospital while complications rate remain the same [2].

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Moreover, conservative management is not always successful. About one fifth of the cases, who were waiting for delayed surgery, had persistent symptoms or developed another acute attack requiring intervention before planned operation [3].

Controversy persists regarding the optimal timing for intervention in AC. Some follow the policy of emergency surgery in 24-96 hours after onset of symptoms while others suggest early surgery in acute phase within 3 days after admission and still others define 'early' as ranging from 24 hours to 7 days from diagnosis or onset of symptoms [4, 5]. The Tokyo guidelines of the Japanese society of hepatobiliary-pancreatic surgery suggested that emergency cholecystectomy was indicated for patients with symptoms within 72 hours while that of the national institute for health and care excellence (NICE) recommended that AC should be treated within seven days of diagnosis [6].

While accepting early surgery for AC, consensus is still lacking regarding technical aspects, whether open or laparoscopic cholecystectomy is to be done. Considering presence of inflammation, edema, necrosis and adhesion are unfavorable for safe dissection [2], 48.7% of AC are operated with the open technique. Some literature and Tokyo guideline 2013 have shown concern about supposedly higher mortality rates in emergency laparoscopic cholecystectomy (AL) in AC. According to some author, conversion rate to open procedure is also higher during LC in acute phase [7, 8]. On the other hand, some randomized controlled trials 10- 13 and meta-analysis14-16 recommended acute phase LC with the advantage of fewer complications, less operative blood loss and shorter post-operative LOS [9]. Gonzalez Rodrigueg FJ et al considered urgent LC 72 hours after onset of symptoms to be difficult and associated with higher risk of complications [10]. While some studies found no difference in conversion rate, morbidity and LOS between patients with symptoms less or more than 72 hours.

Many of our patients present late due to financial or personal constrains, ignorance, fear of operation, delayed diagnosis, and getting treatment in another hospital. Delay also occurs due to failure of conservative management, recurrent symptoms before planned operation or due to optimization of medical condition for possible safe anaesthesia. Whatever may be the cause of delay, progressive inflammation may lead to complication like gangrene and perforation of the gallbladder and pericholecystic abscess formation compelling urgent surgery. The feasibility and safety of LC for AC and its squeal 7 days after symptom onset in patients who were unable to receive earlier surgery are unclear. This retrospective study was aimed to observe the feasibility and safety of emergency and urgent LC in AC and its sequelae during persisting symptoms in same admission.

Methods

Between January 2015 and January 2021, 320 patients were admitted in a surgical unit of Satkhira District Hospital, Satkhira Medical College & Hospital and different private hospitals & clinics in Satkhira District with a diagnosis of acute cholecystitis or its complications. The patients were assessed clinically (Murphy's sign or right upper quadrant abdominal pain or tenderness or mass & fever) with laboratory tests (leukocytosis, liver & pancreatic enzymes) and imaging (ultrasound examination and computed tomography in selected cases). We planned laparoscopic cholecystectomy in all cases as soon as assessment and resuscitation were completed irrespective of duration from symptom onset. 20 patients were excluded

from this study as their surgery was due to high risk for emergency surgery (poor general condition, cardiac function, renal function, or recent stroke). Emergency LC was done in rest of the patients (300), by a single attending surgeon using standard four port technique. The gallbladder was decompressed by aspirating its contents. The cystic artery and duct were skeletonized and sealed using hem-o-lock or ligation with intra-corporeal knot with mersilk no 2 individually. Saline irrigation was done in all cases. A sub-hepatic tube drain was placed in those with perforated or gangrenous cholecystitis or pericholecystic abscess. Gallbladder were removed through epigastric port. Those having gangrene, perforation, transmural infection or spillage of stone were placed in 'glove-bag' before removal. Histopathological examination of resected gall bladder was routinely performed to confirm acute cholecystitis. Cases were analyzed for gender, age, operation time, volume of blood loss, conversion to open surgery, post-operative complication and length of hospital stay. Operation time was defined as beginning with skin incision and ending when dressing has been placed over ports.

Results

A total of 320 patients with AC and its squeal were admitted, between January 2015 and January 2021 in Satkhira District Hospital, Satkhira Medical College & Hospital and different private hospitals & clinics in Satkhira District. Among them 300 patients were treated with emergency or urgent laparoscopic cholecystectomy. As most of the cases were evaluated in emergency or outpatient department, preoperative hospital stay were only few hours for resuscitation except inpatient referred cases, acute pancreatitis or on anti-platelet drugs. Patients' demographics are shown in Table I.

Table 1: Demographic profile of the patients (n=300).

Gender	Frequency n (%)
Male	180 (60)
Female	120 (40)
Mean Age- 45 years (22-68 years)	

The ASA scores of the patients were classified as 1E, 2E, and 3E (Table 2).

Table 2: ASA score of the patients (n=300).

ASA score	Frequency n (%)
1E	60 (20)
2E	60 (20)
3E	180 (60)

Time from onset of symptoms to admission was 7 (0.5-16) days. Table 3 shows clinical, imaging and laboratory characteristics of the patients.

Table 3: Clinical features, imaging and laboratory characteristics (n=300).

Clinical features, imaging and laboratory characteristics	Frequency n (%)
Murphy's sign +ve	280 (93.33)
Temperature (>37º C)	150 (50)
Enlarged distended gall bladder on USG or CT scan	250 (83.33)
GB wall thickness on USG or CT scan (mm)	3.8 (2-8)
Pericholecystic edema	260 (86.66)
Swollen edematous pancreas	6 (2)
Abdominal fluid collection	6 (2)

Operative findings of the patients are demonstrated in Table 4. The earlier the patient presented for surgery and those who were treated with antibiotics were easier to operate. Incidence of gangrene and perforation were more among those with acalculus cholecystitis. Among six patients with acute pancreatitis, two were in ICU for initial days of management and surgery were done one day after stepping down to ward or cabin. Surgical procedures were the most difficult in those presented beyond two weeks of symptom onset.

Table 4: Operative findings of the patients (n=300).

Operative Findings	Frequency n (%)
Simple calculous acute cholecystitis	248 (82.66)
Acute cholecystitis with dense adhesion	20 (6.66)
Acalculous acute cholecystitis	10 (3.33)
Gangranous cholecystitis	10(3.33)
Perforated cholecystitis	6 (2)
Gall stone with acute pancreatitis	6 (2)

Table 5: Outcome and complications of emergency laparoscopic cholecystectomy (n=300)

Outcome	Values
Conversion to open surgery (frequency)	20 (6.66)
Operation time (minutes)	75 (35-122)
Blood loss (ml)	130 (10-350)
Use of sub-hepatic drain (frequency)	30 (10)
Use of umbilical port drain (frequency)	30 (10)
Complication	**Values**
Bile leakage (frequency)	10 (3.33)
Sub-hepatic fluid collection (frequency)	3 (1)
Port infection (frequency)	3 (1)
Length of stay in hospital [days n (range)]	2 d (20 hr- 9 d)
Readmission for pain (frequency)	2 (0.7)

Consequently operation time was over 100 minutes and blood loss was more than 250ml in such cases (Table 5). On 20 required conversion to open procedure. Sub-hepatic drain were used in 17 cases, most of which were removed 2-3 days post-operatively except three, who had bile leak due to total gangrene of gall bladder and cystic duct. Bile discharge dried up in 4th, 7th and 9th post-operative day respectively. Subcutaneous simple tube drain in umbilical port was used in those with gangrene perforation and transmural gall bladder wall pyogenic infection ; removed in first follow up on 7th post-operative day, consequently umbilical port infection were very low (3 cases, 0.6%). One patient presented with sub-hepatic fluid collection, 6 weeks after emergency LC. Laparotomy was done and found to have altered blood and pseudo-aneurysm of cystic artery (chronic blood loss from one of its lateral twig). Length of stay (LOS) in hospital were short (mean-2 days, range: 20 hours-9 days) except those with bile leak (5, 8 and 9 days respectively). None of the cases had bile duct injury or uncontrolled bleeding. There was no mortality in this series.

Discussion

Early LC (emergency, urgent, expedited) is a feasible treatment option in patients with AC [1]. Gall stone related complications develop in 1-4% of patients per year such as AC. Since pre-laparoscopic era early surgery has shown advantage in terms of hospital stay and reoperation time [2]. Modern trend is towards an increased rate of early laparoscopic cholecystectomy (ELC) for AC. But the exact time point of ELC in AC is still a matter of debate. Tokyo Guidelines 2013 preferred to perform LC within 72 hours of symptom onset [6], whereas NICE recommended LC in AC within 7 days of diagnosis [7]. Till now there is no published document on LC beyond 7 days of onset of AC. We have treated all of our patients (except 20 out of 320, 6.25%) who presented with AC or its squeal irrespective of its severity, time of appearance from symptom onset and treatment received. All these cases were analyzed retrospectively for efficacy and safety of urgent LC during acute phase. We did not require any conversion during operation. Some author considered potentially serious complications and conversion rates were

higher in early LC in AC [11]. But facts are changing with time and expertise. A meta-analysis demonstrated a reduction in overall mortality rate with LC in AC performed in the same admission [2]. LC in late phase of AC (4-7 days) till 2004 was reported to have higher conversion rate to open surgery, while recent studies revealed equivalent hospital stay and lower conversion rate of 3% in early phase and 8% in late phase of AC [1]. In one of our study including all cases of LC, we found that chronic symptom in elderly male and fibrosed contracted GB at imaging (USG or CT scan) were independent predictors of procedure conversion during LC. They concluded that ELC in late phase is superior to delayed laparoscopic cholecystectomy (DLC) 6-8 weeks after AC subsided with conservative treatment. One study from UK demonstrated that a third of their patients were readmitted with recurrent symptoms often more than once while awaiting for DLC [7].

We operated most of our cases within 24 hours after admission. As expected, we found that severity of AC increases with time from its onset, thickening and hardening of GB wall leads to difficulty in handling and dissection with conventional instruments, neovascularization increased blood loss from adhesions associated GB surface. The sooner the LC is attempted, the easier and less time consuming with least bleeding the procedure can be accomplished.

Pericholecystic edema creates an easy dissection plain especially in those who received antibiotics. These facts increased operation time but did not increase perioperative complication or hospital stay. Meta-analysis found that bile leak rate had no relation with technique (open or laparoscopy). Severity of bleeding in AC, treated either by open or laparoscopy, was not significantly different [2]. It also confirmed reduced mortality, morbidity and post-operative hospital stay without increasing the operation time, reduced operative hemorrhage rates, less expensive, and resulted in better quality of life when AC was treated with ELC compared to DLC. Patience, taking time in dissection, keeping operation field as clean as possible by taking care of 'first drop of blood', clear identification of structures of the region before division, use of telescope with an angle (we used 450) when needed, were important tricks in successful completion of LC in complicated AC cases.

One of our female patients required readmission and laparotomy, 6 weeks after ERCP followed by LC for common bile duct stone and AC, due to sub-hepatic fluid collection. Rest of our patients recovered without any intra-abdominal consequences. Cases with gangrenous and perforated cholecystitis or per-operative tear of GB with spillage of stones were common in late presented cases which were managed with copious saline irrigation, removal of stone and GB in a 'glove-bag' and use of a sub-hepatic drain, hence outcome was not affected in terms of mortality or LOS in hospital. As we assessed most of our patients before admission, LOS in hospital was much less than other series. The total expenditure of treatment was not documented but a rough overview of cost involvement assessed. Other options of management of AC using antibiotics alone or in combination with percutaneous cholecystectomy followed by DLC were associated with no difference in operative time or conversion rate, but LOS, readmission and costs were higher than ELC [12]. Strength of the study is that all AC cases, fit and willing to undergo ELC were included, irrespective of severity and duration of disease onset. Weakness of the study is that it is a retrospective study.

Conclusion

Emergency and urgent laparoscopic cholecystectomy in acute cholecystitis and its squeal appears to be effective and safe at any time during persisting symptoms. It has the benefit of minimum conversion rate, morbidity, mortality and short hospital stay. Technical difficulties of the procedure are proportional to the time of surgery since onset of the symptoms. The procedure in late presenting cases are associated with longer operation time and more blood loss without influencing operative complications.

However large randomized controlled trials are needed to draw a solid conclusion and firm recommendation.

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Original Article

Early Management of Clubfoot by the Ponseti Method with Complete Percutaneous Tenotomy of Tendoachillis

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Abstract

Background and Objective: As a highly common congenital deformity which can lead to serious walking problems, clubfoot has long been treated using the Ponseti method which is usually carried out without complete percutaneous tenotomy of tendoachillis. The present study was aimed at investigating the effects of early management of clubfoot by the Ponseti method with a complete percutaneous tenotomy of tendoachillis in District Hospital, Satkhira and Satkhira Diabetic Hospital at Satkhira, Bangladesh at Ponseti clinic. **Methods:** Thirty neonates of <3 months of age who had congenital idiopathic clubfoot were randomly selected. They were treated by the Ponseti method. For this purpose, successive casts were applied to them for 3 weeks, with changing the casts on a weekly basis. For those who did not respond to the first 3 weeks of casting, the classical Ponseti method was utilized along with complete percutaneous tenotomy of tendoachillis based on the theory of stem cell regeneration. Then, the casting was performed for 6 weeks, followed by foot abduction brace and maintained using a foot abduction brace (Dennis brown splint) until school age 5-6 years. **Results:** The results of the present study indicated that the most prevalent type of clubfoot was the unilateral type with 73.3% prevalence rate. Treating the newborns with clubfoot by the Ponseti method along with complete percutaneous tenotomy of tendoachillis led to good results in 86.7% of the cases, medium in 3 cases (10%), and poor only in 1 case (3.3%). **Conclusion:** Ponseti method along with complete percutaneous tenotomy of tendoachillis was proved to be an efficient method to treat clubfoot during the first few weeks of life.

Keywords: Clubfoot, complete percutaneous tenotomy of tendoachillis, Ponseti method.

Introduction

Clubfoot, also known as congenital talipes equinovarus (CTEV), refers to a birth deformity that afflicts 1 foot or both, in which 1 foot or both are turned into the inner side [1]. This embryonic deformation is a developmental malformation which occurs in 1 out of 1000 live births during the second trimester of pregnancy [2-4]. There are 2 types of clubfoot: congenital and acquired. The former is in turn categorized into idiopathic and non-idiopathic kinds. Idiopathic type is characterized by single skeletal deformity, being bilateral, late occurrence, and response to conservative treatment, whereas the former kind is characterized by diametrically opposite foot deforma

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tions, association with other deformities, and poor response to conservative treatment. In contrast, the acquired kind occurs as a result of neurogenic and vascular causes [2]. Non-idiopathic clubfoot has been reported to be a kind of congenital deformity that happens as a result of teratologic anomalies, known and unknown neurological disorders, genetic syndromes, and myopathies [5]. In another classification, Clubfoot is categorized into positional or congenital. In the positional type, the clubfoot is because the foot has been held in an unusual position for a long time in the uterus. The congenital type, in contrast, is a fixed condition [6].

According to the results of relevant research, clubfoot is not associated with pain during infancy, but if it is left untreated, the afflicted individual cannot walk normally in the future [4]. Moreover, Pirani et al. pointed out that leaving CTEV untreated can lead to seriously disabling problems, loss of energy, and failure in education and employment [7, 8].

The first treatment of clubfoot was proposed by Ignacio Ponseti in 1963. The treatment of recurrence cases includes tibialis anterior tendon transfer and abduction bracing [9]. The Ponseti method has been evaluated and reviewed in numerous studies. A review conducted in 2011 pointed out that this method is the most effective and successful approach to treat congenital clubfoot with a primary correction rate of ~90% [10].

A significant element of the Ponseti method while being used to treat clubfoot is complete percutaneous tenotomy of tendoachillis [11]. With regard to using complete percutaneous tenotomy of tendoachillis in the Ponseti method, it has been reported that it is safer to utilize it in in the operating room or in polyclinic with local anesthesia [12, 13].

In this regard, the present study was carried out to examine the outcome of early management of clubfoot by the Ponseti method with complete percutaneous tenotomy of tendoachillis and its recurrence rate in relation to age, gender, education of parents, family history, and compliance of family to brace among children with idiopathic congenital clubfoot.

Methods

Our study is a prospective study which was done in District Hospital, Satkhira and Satkhira Diabetic Hospital at Satkhira, Bangladesh during the period from January 2019 to March 2021. Thirty neonates with idiopathic clubfoot were treated and followed up. The neonates were selected using a randomized sampling method and according to the inclusion criteria (i.e. neonates of <3 months of age and both genders) and exclusion criteria (i.e. neonates of over 3 months of age, neonatal drop foot, postural clubfoot, relapse cases, and syndromic cases such as myelomeningocele, arthrogryposis, and cerebral palsy). After the parents were provided with necessary explanations on the treatment technique, outcomes, complications, duration, and visits, informed written consent to participate in the study was obtained from them. Afterward and before the treatment, data on the neonates' age, gender, education of parents, family history, and compliance of family with a brace were collected through a checklist.

During the first 3 weeks of treatment by the Ponseti method, casts were applied for each patient once a week. Applying casts for the patients was stopped once the correction of the varus of the foot and the lateral ray of the foot was achieved. For those patients whose equinus was not corrected, complete percutaneous tenotomy of tendoachillis was performed.

After correction of lateral ray and correction of varus was performed and complete percutaneous tenotomy of tendoachillis was done, casts were applied for the patients for a duration of 6 weeks. After 6 weeks and when the last cast was removed, the maintenance phase started during which foot abduction braces (Dennis brown splint) were applied for all of the neonates 24 hours per day for 3 months. After that 3 month period, the patients wore foot abduction braces (Dennis brown splint) during the night and received physiotherapy during the day for 1 year. Moreover, once the children started walking, they were given special walking shoes, and they wore foot abduction braces over the night until school age 5-6 years.

To take the ethical considerations into account, the neonates' parents were provided with a full explanation of the study's objectives, the treatment, possible outcomes and complications, study duration, and visits. Moreover, they participated in the study quite freely and voluntarily after informed written consent was obtained from them.

Results

The patients' demographic characteristics, family history, place of residence and educational status of the parents is stated in table 1. Results of the Ponseti method along with complete percutaneous tenotomy of tendoachillis is shown in table 2 and status of the patients during the treatment is shown in table 3.

Table 1: Demographic distribution of the studied patients (n=30).

Categories		Frequency n (%)
Age (days), (mean±SD)		18 ± 2.26
Sex	Male	18 (60)
	Female	12 (40)
Affected Foot	Bilateral	8 (26.7)
	Unilateral	22 (73.3)
	Right	10 (45.5)
	Left	12 (54.5)
Family history	Positive	4 (13.3)
	Negative	26 (86.7)
Place of residence	Urban	17 (56.7)
	Rural	13 (43.3)
Educational status	Educated	18 (60)
	Illiterate	12 (40)

Table 2: Results of the Ponseti method along with complete percutaneous tenotomy of tendoachillis (n = 30).

Results	Frequency n (%)
Good	26 (86.7)
Medium	3 (10)
Poor	1 (3.3)

Table 3: Status of the patients during the treatment (n = 30).

Status	Frequency n (%)
Recurrence	2 (6.7)
Noncompliance	2 (6.7)
Successful	26 (86.6)

Discussion

According to the results of the present study, all of the neonates received treatment under the age of 3 weeks with a mean age of 18 days. In this regard, the present study is in line with those investigations that have demonstrated that congenital clubfoot should be treated as soon as possible to come up with the most reliable results [14-16]. The results also revealed that clubfoot was more prevalent among male newborns than females, this finding is in line with the results of the studies carried out by Desai et al. (2010), Morcuende et al. (2003), and Dobbs et al. (2004) [17-19].

Regarding the types of clubfoot, it was seen that most cases (73.3%) had unilateral clubfoot and 26.7% had bilateral clubfoot. In their studies, Bhaskar et al. (2006) and Sami et al. (2010) reported that bilateral type of clubfoot was more prevalent than unilateral type,[20,21] whereas in the study carried out by McConnell et al. (2016), more cases had unilateral clubfoot [22]. In the present study, family history was negative in 86.7% of the cases. This finding is in good agreement with the one carried out by McConnell et al. (2016) who reported that 94% of the patients with clubfoot did not have a family history of the deformity [22].

The dominance of the cases with clubfoot living in urban areas can be justified through the fact that a larger population live in cities and towns and account for a larger portion of medical clients. The results also revealed that parents of 60% of the cases were educated. No similar findings have been reported by any previous studies. Avilucea et al. reported that there is an association between low parental education and recurrence of clubfoot [23].

The results of the present study indicated that the clubfoot treatment by the Ponseti method with a complete percutaneous tenotomy of tendoachillis had good results in 26 cases (86.7%), medium in 3 cases (10%), and poor in 1 case (3.3%). This finding is in line with those of the study conducted by Saini et al. in India who reported that treating newborns by Ponseti method led to good results in 79% of the cases, fair in 5%, and poor in 16%.[24] Similar findings were also reported by other previous studies [25-27].

During the treatment, only 2 cases of recurrence were observed. This finding is in good agreement with numerous studies that reported very limited rate of recurrence [28-30] or no recurrent cases [31-33]. In addition, a lack of compliance with the treatment was observed in 6.7% of the patients. Furthermore the noncompliance rate of 32%–61% reported by Zionts and Dietz (2010) [34]. In the study carried out by Nogueira et al., noncompliance with bracing in clubfoot treatment has been contributed to systematic inequities and challenges [35].

Furthermore, the results of this study indicated that treatment of the clubfoot cases by the Ponseti method along with complete percutaneous tenotomy of tendoachillis led to a success rate of 86.6%. Lara et al. also reported a high rate of successful treatment through Ponseti treatment [36]. Similar to the present study, Verma et al. reported a success rate of 90% [37].

Conclusion

Ponseti method with a complete percutaneous tenotomy of tendoachillis was proved to be an efficient technique to correct clubfoot. The effectiveness of this method was proved in this study and many other previous studies particularly if it is performed during the first weeks of life. The success rate of this method, as shown in this study, was 86.6%. Therefore, it is highly recommended that newborns with clubfoot should be provided with treatment by Ponseti treatment during the first few weeks of life if the classical Ponseti technique failed to correct the situation to come up with complete correctness and prevent future complications caused by their deformity.

The results of the present study should be interpreted and later implemented or generalized within the framework of its limitations. The first limitation of the present study was the short follow-up period of 2 years, whereas the literature suggests that braces should be utilized for 3–4 years of age to make sure that there will be no recurrence; however, the

patients in the present study were followed up for 24 months.

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Original Article

Bronchial Asthma in Relapse Case of Idiopathic Nephrotic Syndrome and their Clinical Profile

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Abstract

Background: Most children (90%) with nephrotic syndrome are idiopathic nephrotic syndrome and it is chronic relapsing in nature. Bronchial asthma is an important cause of relapse and is associated with nephrotic syndrome in children. The aims and objectives of the study were to determine the types of bronchial asthma in children with a different pattern of idiopathic nephrotic syndrome. **Methodology:** This cross-sectional observational study was carried out in the Department of Pediatrics Nephrology of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from January 2017 to December 2017. Two hundred children aged 1-18 years with infrequent relapse, frequent relapse, steroid depended & steroid-resistant nephrotic syndrome were enrolled in this study. Nephrotic syndrome with bronchial asthma was labeled as group I. They were 90 (45%) in number and were age and sex matched. Among them 8 children were intermittent asthma, 22 children were mild persistent asthma, 52 children were moderate persistent asthma, and 8 children were severe persistent asthma. Nephrotic syndrome without asthma was labeled as group II. A total of 110 (55%) children were enrolled in this group. **Results:** Mean age of patients in group I (6.79 ± 2.7 years) was higher than that of group II. Mean number of relapses in group I (6.11 ± 6.6) was significantly higher than that of group II. Almost two-third (63.3%) of patients had a history of allergy in group I and 37(33.6%) in group II. Sixty-six (73.3%) had a family history of allergic disease in group I and 34 (30.9%) in group II. It was observed that almost half of the (43.3%) patients had frequent relapse plus steroid-dependent nephrotic syndrome in group I and 38 (34.5%) in group II. **Conclusion:** Bronchial asthma in childhood nephrotic syndrome is an important comorbidity. Number of relapses was significantly higher in children who had nephrotic syndrome with bronchial asthma. Mild and moderate persistent asthma was more common in different types of nephrotic syndrome. Circulating eosinophil count & serum IgE level were significantly high in children who had nephrotic syndrome with bronchial asthma.

Keywords: Bronchial Asthma, Nephrotic syndrome.

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Introduction

Nephrotic syndrome (NS) is primarily a pediatric disorder. It is 15 times more common in children than adult. It is characterized by massive proteinuria (urinary total protein >1 gm/m²/24 hours), hypoalbuminemia (serum albumin < 2.5 gm/dl), edema and hyper cholesterolemia (serum cholesterol >250 mg/dl [1]. It is typically seen in children in the age group of 2-6 years and is uncommon in the first year of life. Eighty percent children with nephrotic syndrome are less than 6 years old at presentation with median age at diagnosis being 2.5 years for minimal change nephrotic syndrome (MCNS) and 6 years for focal segmental glomerulosclersis (FSGS). Male to female ratio is 2:1 in typical age group and 3:2 in younger children less than 2 years [2]. Non-minimal change nephrotic syndrome is common after 8 years age [3-5]. The incidence of all types of nephrotic syndrome in children is 2-4 per 100,000 population, but this varies in different ethnic group. Incidence in the United States range from 2 to 7 new cases in children under 16 years of age per 100,000 total population [6], but it is much higher in Asia and Africa, where incidence 9-10 per 100,000 population [1]. A study on Asian children in two cities of the United Kingdom has reported 9 and 16 per 100,000 respectively [7]. Ninety percent cases of nephrotic syndrome in children is primary or idiopathic, 80% of whom show histological features of minimal change nephrotic syndrome (MCNS). Eighty to ninety percent of children with nephrotic syndrome is steroid sensitive and rest 10-20% nephrotic syndrome is steroid resistant [8]. The remainder 5 percent cases are caused by systemic disease like systemic lupus erythematosus (SLE), Henoch Schonlein purpura (HSP), hepatitis B, malaria, drugs, malignancy, amyloidosis etc [9]. Numerous reports during the last 60 years have reported a strong association between idiopathic nephrotic syndrome and atopic disorders [10]. The atopy was more frequent among steroid sensitive than steroid resistant nephrotic syndrome [11]. Several children have had relapses of nephrotic syndrome during asthma attack though the frequency of relapse is highly variable [12, 13]. IgE level were significantly higher in nephrotic syndrome patients with atopy than in non-atopic patients.

During relapse phase of nephrotic syndrome compared with remission phase, IgE is considered as a barometer of disease severity. In asthma the specific localization of IgE in the bronchial mucosa suggests a pathogenetic role for IgE. Atopy is associated with up 30% of cases of idiopathic nephrotic syndrome (INS) [14]. Several authors have reported allergic symptoms in patients with steroid-sensitive nephrotic syndrome (SSNS). Higher serum IgE levels in nephrotic children have been related to poor outcome with frequent relapses or poor responses to steroid therapy [11]. Several persons have had relapses of nephrotic syndrome during an asthma attack or have undergone spontaneous remission of renal and respiratory symptoms with hyposensitization therapy.

In the last few decades, the increase in such diseases, particularly in the developed parts of the world, has been increased to such an extent that the phenomenon has been referred to as an “allergic epidemic” [15]. Allergic conditions constitute a serious public health problem in modern society. Asthma, as an example, is one of the common chronic diseases observed during childhood, exerting a considerable amount of impact on the child’s quality of life [12]. One study has shown that 34% of children with nephrotic syndrome have history of allergic disorder like asthma, eczema, recurrent urticaria and hay ever [15]. Another study in this country has shown that

bronchial asthma and allergic dermatitis were high in all forms of nephrotic syndrome [8].

Methodology

This is a cross sectional study which was conducted by the Department of Pediatric Nephrology of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh in between January 2017 to December, 2017. Two hundred children aged 1-18 years with infrequent relapse, frequent relapse, steroid dependent & steroid-resistant nephrotic syndrome were enrolled in this study. Children with congenital & 1st episode nephrotic syndrome, nephrotic syndrome secondary to systemic disease like systemic lupus erythematosus, hepatitis B, Henoch Schonlein purpura, malaria, lymphoma and amyloidosis, nephrotic syndrome secondary to drugs like nonsteroidal anti-inflammatory drugs, penicillamine, gold, mercury etc and those parents/patients who were refused to participate were excluded. The 200 children included in the study were grouped as Group I (n=90) who were suffering from nephrotic syndrome with bronchial asthma. They were again subdivided in to intermittent asthma (8), mild persistent asthma (22), moderate persistent (52) and severe persistent asthma (8). Children with nephrotic syndrome without bronchial asthma were grouped as, Group II (110).

Serum IgE was done in the department of Microbiology and Immunology and circulating eosinophil count were done in the department of Clinical Pathology of BSMMU.

The aim and objectives of this study along with its procedure, nature, risk and benefit were explained to the parents in easily understandable local language and then informed written consent was taken from each parent. Participation in this research is fully voluntary. The respondents were remained entirely free to withdraw their participation at any stage or any time of the study. After collection, all the data were checked and edited and analyzed through the software, statistical package for social science (SPSS).

Results

It was observed that majority of patients belonged to 6-10 years in group I and ≤5 years in group II (table 1). The mean age difference between two groups was not statistically significant. Sex of the study patients shows 52 (57.8%) patients were male in group I and 83(75.5%) in group II. Male child were predominant in group II and the difference with group I was statistically significant.

Table 1: Distribution of the study patients by demographic variables (n=200).

Demographic variable		Group-I (n=90) n (%)	Group-II (n=110) n (%)	*p* Value
Age (year)	≤5	19 (21.1)	71 (64.5)	
	6-10	41 (45.6)	33 (30)	
	>10	30 (33.3)	6 (5.5)	0.51^{ns}
	Mean ± SD	6.79 ± 2.7	5.12 ± 2.9	
	Range	3.5-14	1.5-14	
Sex	Male	52 (57.8)	83 (75.5)	0.007^{s}
	Female	38 (42.2)	27 (24.5)	

Table 2 shows that relapse rate was more in group I and the difference with group II was statistically significant. Fifty seven (63.3%) patients had history of allergy in group I and 37(33.6%) in group II. Majority of the patients in group I had history of allergy and the difference with group II was statistically significant. Family history of allergic disease in group I was 66 (73.3%) and 34 (30.9%) in group II. It was observed that two third of the patients in group I had family history of allergic disease and the difference with group II was statistically significant.

Table 2: Distribution of the study patients according to relapse and history of allergy (n=200).

Variable	Group-I (n=90)	Group-II (n=110)	*p* Value
Number of Relapse			
(Range)	6.11 ± 4.4	3.41 ± 3.2	0.006[s]
(Mean ± SD)	0 - 20	0 - 12	
History of Allergy			
Yes [n (%)]	57 (63.3)	37 (33.6)	0.001[s]
No [n (%)]	33 (36.7)	73 (66.4)	
Family history of Allergic Disease			
Yes [n (%)]	66 (73.3)	34 (30.9)	0.001[s]
No [n (%)]	24 (26.7)	76 (69.1)	

Table 3: Relationship with different types of asthma with nephrotic syndrome (n=90).

Type of Asthma	IFRNS (n=31); n (%)	FRNS + SDNS (n=51); n (%)	SRNS (n=8); n (%)	*p* Value
Intermittent asthma	3 (9.6)	3 (5.8)	2 (25)	0.104[ns]
Mild persistent asthma	10 (32.2)	11 (21.5)	1 (12.5)	
Moderate persistent asthma	15 (48.3)	35 (68.6)	2 (25)	
Severe persistent asthma	3 (9.6)	2 (3.9)	3 (37.5)	

Table 3 shows presence of intermittent asthma 3 (9.6%) patient in IFRNS, 3 (5.8%) patients in FRNS with SDNS & 2 (25%) patients in SRNS. Mild persistent asthma were 10 (32.2%) patients in IFRNS, 11 (21.5%) patients in FRNS with SDNS & 1 (12.5%) in SRNS. Moderate persistent asthma were 15 (48.3%) patients in IFRNS, 35 (68.6%) patients in FRNS with SDNS & 2 (25%) patients in SRNS. Severe persistent asthma were 3 (9.6%) in IFRNS, 2 (3.9%) in FRNS with SDNS & 3 (37.5%) in SRNS. It was observed that moderate persistent asthma was found near about half of patients in IFRNS, more than half in FRNS with SDNS, one fourth patient in SRNS. The difference was not statistically significant in different types of asthma with nephrotic syndrome.

Table 4 shows that the mean circulating eosinophil count was 1532.5 ± 234 /cmm in group I and 342±122 /cmm in group II and the difference with group II were statistically significant. IgE was 1215.75 ± 64 IU/ml in group I and 346 ± 27 IU/ml in group II showing a statistically significant difference.

Table 4: Laboratory parameters in the study subjects (n = 200).

Laboratory Parameter	Group-I (n=90) n (%)	Group-II (n=110) n (%)	*p* Value
Circulating Eosinophil count (per cmm)	1532.5 ± 234	342 ± 122	0.001[s]
Serum IgE (IU/ml)	1215.7 ± 64	346 ± 27	0.001[s]

Discussion

Nephrotic syndrome is a common renal disease all over the world. It is a disease of relapse and remission with relapse in more than 70%.of the cases. Among the predisposing factors for relapse, bronchial asthma and other atopy are common [1]. Among 200 pediatric patients under the present study, age ranged from 1 to 18 years and mean age of

patients of group I (6.79 ± 2.7) was higher than that of group II (5.12 ± 2.9), though the difference was insignificant. This finding was correlated with a similar type of study conducted by Mohammad in 2005 [16] and found mean age of patients were 6.8 years. In this study, majority of the patient in each group were male and p value was significant (p=0.007). Mohammad (2005) also observed male predominance in their studies [16]. Mean number of relapses in group I was 6.11 ± 4.4 and group II was 3.41 ± 3.2 in this study. p value was significant (p=0.006). Statistically significant number of children with group I had history of allergy and family history of allergy (p=0.001). Meadow et al (1981) [15] also found a positive history of an allergic disorder present in 34% of children with nephrotic syndrome and 50% children with nephrotic syndrome had family history of allergy.

In present study, mean circulating eosinophil count was 1532.5 ± 234/cmm in group I and 342 ± 122/cmm in group II. P value was significant (p<0.05). There is no comparable data because no similar type of study was done previously. In this study, mean IgE level was 1215.75 ± 64.0 in group I and 346 ± 27.0 in group II. It was statistically significant. P value was 0.001. This finding corroborates other research findings from previous studies. Ninik et el. (2005) and Tai et.al (2003) had similar observation of higher IgE level in nephrotic syndrome with atopy.

Conclusion

Bronchial asthma in childhood nephrotic syndrome is an important comorbidity. Mild and moderate persistent asthma were more common in different types of nephrotic syndrome. Number of relapses were significantly higher in children who had nephrotic syndrome with bronchial asthma. Eosinophil count & serum IgE level were significantly high in children who had nephrotic syndrome with bronchial asthma. A multicentric long term study may suffice to come into any conclusion regarding this.

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Original Article

Covid -19 and Bell's palsy - A coincidence or correlation?

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Abstract

Background: The COVID-19 pandemic has exploded since cases were first reported in China in December 2019. Being primarily a pulmonary disease covid-19 has shown various multi-organ involvement among which neurological involvement is not very uncommon. Bell's palsy, although the etiology is unknown is largely related to neurotropic virus and seemed to be more prevalent during this covid pandemic. Our aim of this study was to see the relationship between SARS-CoV-2 infection and Bell's palsy. **Methods:** This is a cross-sectional descriptive study conducted in the Medicine outpatient department of 250 bedded Brahmanbaria district hospital between the periods of 1st July 2020 to 31st December 2020. A total of 128 patients with Bell's palsy were enrolled in the study with their full informed written consent. RT-PCR for covid -19 was tested in all patients and data was analyzed with the variable. **Results:** Among 128 patients with Bell's palsy having no other viral symptoms, 34 patients (26.56%) were found to be covid positive. Among the covid positive patients, 21 (61.76%) were male, 13 (28.23%) females, and most of the covid positive Bell's palsy patients (47.6%) belonged to the 20-40 years age group. Twenty eight patients had no comorbidities whereas 2 patients had diabetes and 1 had hypertension. **Conclusion:** In this study, a significant number of Bells' palsy patients were found to be COVID-19 positive in whom there were no significant comorbidities. This implies the probable role of coronavirus in the causation of Bell's palsy.

Keywords: Bell's palsy, COVID-19.

Introduction

Coronavirus disease (COVID-19) is caused by the novel virus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Since its recent discovery in Wuhan, China, coronavirus disease has spread across the world, leaving physicians challenged by its variable clinical manifestations [1]. Although most patients infected by SARS-CoV-2 have presented with a mild clinical course: beginning with fever and dry cough progressing to a form of mild or moderate respiratory disease, and resolving without specific treatment, serious complications of the infection, however, remain a central concern [2]. Apart from fever, cough, breathlessness, diarrhea, and fatigue, some patients develop neurological symptoms like dizziness, headache, impaired consciousness, acute cerebrovascular disease, seizures, ataxia and peripheral nerve involvement with loss of

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smell or taste and neuralgias [3]. Mao et al. (2020) showed that among the neurological manifestations most of the patients present with smell disorder whereas taste disorder, myalgia, and headache are also important manifestations to concern [4].

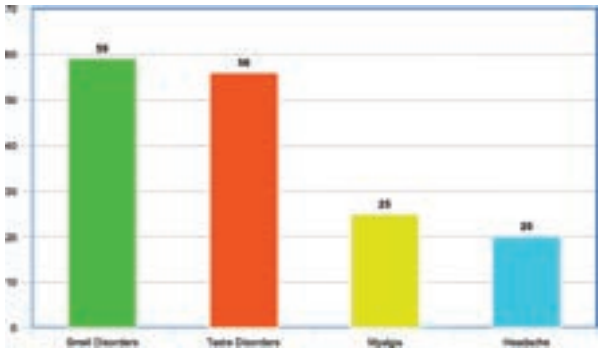

Figure 1: Neurological presentation of SARS-CoV-2.

Recent studies have reported that SARS-CoV-2-related infection may present with cranial neuropathies and facial nerve palsy in SARS-CoV-2-positive patients has so far been described both as isolated and unilateral or bilateral in the context of Guillain–Barre syndrome [5, 6]. The mechanisms by which SARS-CoV-2 may cause cranial neuropathies have recently been hypothesized [7].

Bell's palsy is defined as an isolated, sudden peripheral facial paralysis of unknown etiology and patients usually have a spontaneous uneventful recovery [8]. Though the etiology and pathogenesis of Bell's palsy are mostly unknown, certain cases are usually preceded by mild infection having a suspected viral origin. Studies have shown that viruses such as herpes simplex, rubeola, rubella, mumps, retrovirus, varicella-zoster, poliovirus, Epstein Barr virus, and influenza have been associated with Bell's palsy [9].

We noticed an increased number of Bell's palsy patients attending the outpatient department of our hospital during the covid pandemic and thus our study was aimed to analyze the variation in the incidence and clinical features of patients presenting with facial palsy and to determine whether there are any potential links between the two conditions or not. We also hypothesized that Bell's palsy may be a manifestation of otherwise asymptomatic COVID-19 infection.

Methods

We hypothesized that there might be a potential role of the coronavirus in the pathogenesis of Bell's palsy and thus increased the number of Bell's palsy patients in our outpatient department which may be due to the surge of covid-19 in this area. It was also in our consideration that Bells' palsy may be the only symptom in some covid-19 positive cases. So we have done a cross-sectional descriptive study conducted in the Medicine outpatient department of Brahmanbaria district hospital between 1st July 2020 to 31st December 2020. A total of 164 patients with unilateral facial paralysis were initially included in the study. Patients having known covid symptoms (like fever, cough, anosmia, etc.) and symptoms of viral illness were noted and excluded. Most of the patients were afebrile and not known to have any diagnosed viral infection. We considered consistent with COVID-19 all symptoms ascribable to SARS-CoV-2 infection as listed by the World Health Organization on May 2020 (fever, dyspnea, cough or other respiratory symptoms, fatigue, headache, myalgia, diarrhea, nausea or vomiting, alteration of taste or smell). Patients who were taking treatment for Bell's palsy were also excluded. Patients who had already done a covid test for any illness in the last 14 days were excluded from the study. A total of 140 patients were included in the study and detailed neurological and ENT examinations were done. Eleven patients denied doing the covid test and 1 patient's report was not available. Thus finally 128 patients were enrolled, and RT-PCR tests were sent after taking

informed written consent. Any coexisting illnesses like diabetes, hypertension, COPD, and asthma were sought out and carefully noted.

Table 1: Distribution of the patients according to sex (n = 128).

Gender	Frequency n (%)
Male	68 (53.12)
Female	60 (46.88)

Table 2: Distribution of the patients according to age (n = 128).

Age years	Frequency n (%)
<20	20 (15.62)
20-40	34 (26.56)
40-60	47 (36.71)
>60	27 (21.09)

The mean age group of the study population was 44.6 with the majority of the population being in the 40-60 age group.

Table 3: Lateralization of Idiopathic Bell's palsy (n = 128).

Involved side	Frequency n (%)
Right half of face involved	76 (59.37)
Left half of face involved	52 (40.62)

Table 4: Related pre-existing illness or comorbidities (n = 34).

Comorbidities	Frequency n (%)
Diabetes	11 (8.59)
Hypertension	14 (10.94)
Both diabetes and hypertension	4 (3.12)
others	5 (3.91)

Table 5: RT-PCR test results of the study subjects (n = 128).

RT-PCR	Frequency n (%)
RT-PCR positive	34 (26.56)
RT-PCR negative	94 (73.43)

After the RT-PCR test, 34 patients (26.56%) were found to be Covid +ve among which the majority (47.06%) belong to the 20-40 years age group with a male preponderance. Twenty eight (82.35%) patients have no significant co-morbidities whereas 2 patients (5.88%) were diabetic, 1 (2.94%) was hypertensive and 3 (8.82%) patients have other illnesses (Bronchial asthma, COPD, etc.).

Discussion

While COVID-19 is primarily a pulmonary disease and typically presents as a self-limiting respiratory disease, it has been reported in up to 20% of patients to progress to severe illness with multi-organ involvement. The neurological manifestations of COVID-19 are not uncommon [10]. The most reported neurological manifestations of COVID-19 were myalgia, headache, altered sensorium, hyposmia, and hypogeusia. Uncommonly, COVID-19 can also present with central nervous system manifestations such as ischemic stroke, intracerebral hemorrhage, encephalon-myelitis, and acute myelitis, peripheral nervous manifestations such as Guillain-Barré syndrome and Bell's palsy, and skeletal muscle manifestations such as rhabdomyolysis [11, 12].

Mao et al. (2020) showed in their study that neurological manifestations are more common in hospitalized covid patients and among them mononeuropathy is the most common [4]. The association between acute mononeuropathies and COVID-19 has recently been described by Costello & Dalakas, 2020; Dinkin et al., 2020; Goh et al., although not definitive [5-7].

Viral infections can cause facial paralysis by infecting the motor neurons of the brainstem, seventh nerve ganglia, or through infections of supporting cells of the nerve, along with secondary inflammation and edema, blocking the nerve function. Similarly, coronaviruses are also known to have a neuroinvasive propensity

[13]. Asymptomatic individuals may have recoverable viruses in their nasopharynx reflecting the prevalence of the virus in the community or representing an exacerbation of a latent infection. Coronaviruses can cause nerve tissue injuries through several known mechanisms like direct infection injury, hypoxia, ACE 2 receptors, and immune injury [14]. In a study by Fang et al, they have hypothesized that patients with diabetes and hypertension, on treatment with ACE 2 stimulating drugs have an increased risk of developing severe and fatal COVID19 [15].

Goh et al. (2020) have found in their study that during the covid pandemic younger patients are mostly affected by facial palsy whereas in our study most of the patients with facial palsy belonged to the 40-60 yrs age group(n=37) [6]. Among these 37 patients 14 were found to be covid positive on RT-PCR. Most of the covid positive patients with facial palsy belonged to the 20-40 years age group (n=16). There was no comparable data regarding Bell's palsy and covid positivity as there was no similar study available online.

In our study, 100 patients with Bell's palsy have no comorbidities whereas 11 patients were diabetic and 14 were hypertensive. Four patients have both diabetes and hypertension, and five patients have other illnesses like asthma, COPD, Chronic kidney disease, etc. In another study, the bivariate analysis showed an increased risk of Bell's palsy for patients with diabetes or hypertension. Logistic regression results stratified for patients younger than 40 years of age and others showed that diabetes was the independent predictor of Bell's palsy in both age groups. Logistic regression results showed that hypertension could not independently predict the occurrence of Bell's palsy among patients younger than 40 years but for older ones it could [15].

After RT- PCR for covid -19 test, among 128 patients 34 (26.56%) were found to be positive of whom 21 was male and 13 was female, majority of the covid positive Bell's palsy patient belonging to 20-40 years age (n = 16), 28 patients had no comorbidities whereas 2 patients were diabetic and 1 was hypertensive. Fang et al. (2020) tried to demonstrate the relationship between diabetes and hypertension with covid -19 infection although the result was inconclusive [15]. This result was not validated in our study as only 2 of the diabetic patients with Bell's palsy were found to be covid positive. Similarly, only 1 of the 14 hypertensive Bells' palsy patients was revealed as covid positive.

Thus, in our study, our hypothesis of Bell's palsy may be the only manifestation of covid-19 infection in at least some extent, seemed to be true as that cannot be better explained by any other cause or co-morbidities.

Conclusion

As COVID-19 outbreak is still a new topic and needs much more research to come to a hard conclusion. Apart from respiratory symptoms, covid may present with non-respiratory symptoms as evident by many case reports. Bell's palsy as a manifestation of covid-19 virus infection is not very unlikely as its pathogenesis is largely related to neurotropic virus and SARS-CoV-2 has a neuro-invasive property. A large-scale prospective study is needed to suffice the study and to come to a conclusion.

Conflict of Interest

All authors report no disclosures relevant to the manuscript.

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Original Article

Evaluation of Outcomes of Core Decompression and Various Types of Bone Grafting in Steroid Induced Early Stages of Avascular Necrosis of Femoral Head in a Specialized Hospital with Short Term Follow up

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Abstract

Background: Femoral head is the commonest site of osteonecrosis (ONFH) or avascular necrosis (AVN) of bone, which usually occurs in the third to fifth decade. In early stages of AVN before collapse of femoral head, core decompression (CD) and bone grafting may reverse or at least preserve from progression of AVN and thereby results in good outcome. In this study, we evaluated the clinico-radiological outcomes of core decompression (CD) and various types of bone grafting in early stages of AVN of femoral head. **Methods:** This study was done at Shaheed Sheikh Abu Naser Specialized Hospital, Khulna, Bangladesh from December 2015 to April 2022, which includes 20 patients with 28 hips of AVN of femoral head from same etiological origin- steroid induced AVN of femoral head up to Ficat and Arlet stage 2 and ARCO stage 2C, which were treated operatively with CD and two types of bone grafting, like autologus non-vascularized fibular grafting (4 hips) and autologus cancellous bone grafting (24 hips) harvesting from anterior superior iliac crest. All the patients were operated in supine position in a C-arm compatible fracture table under c-arm guidance. Advance stages of Ficat and arlet or ARCO system like 3 or onwards were excluded as those were reffered to higher centres. Only steroid induced AVN were included in this study for better understanding and comparison of different outcomes of same etiological origin. **Results:** In follow up, outcomes were assessed by Harris hip score and radiological evidence. Our findings in those cases were- 14 hips (HHS = 92.5%) had excellent outcomes, 8 hips (HHS = 84.6%) had good, 3 hips (HHS = 70.8%) had fair and 3 hips (HHS = 54.2%) had poor outcomes. In ARCO classification system 5 hips of stage 1 (100% of stage 1), 14 hips of stage 2A (77.8% of stage 2A) and 1 hip of stage 2B (25% of stage 2B) showed improvement. One hip of stage 2C (100% of stage 2C) showed no improvement rather further collapse of femoral head. Total 5 cases (17.87% of total hips) showed static condition with no improvement or deterioration till this study. Out of 28 hips 3 hips (10.7% of total hips) required further procedures like hip replacement surgeries. Non weight bearing advise was strictly complied in 22 hips (78.57%) and 6 hips (21.43%) were not complied strictly. **Conclusion:** Core decompression (CD) and bone grafting in early stages of AVN of femoral head gives satisfactory outcomes and very much effective in preserving the bony outline or sphericity of femoral head, which at least halt or delay the progress of AVN of femoral head. Thereby, early diagnosis and selection for CD and bone grafting may aid in the early revascularization of ischemic femoral head, which is very much useful to save or delay the requirement of hip replacement surgery, which is a huge burden in all spheres of a society, especially like ours.

Keywords: Avascular necrosis (AVN), core decompression (CD), hip replacement surgery.

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Introduction

Avascular necrosis (AVN) or Osteonecrosis is defined as a cellular death of bone components due to ischemia of various origin or combination of these. AVN of femoral head occurs due to interruption in the blood supply to the sub-chondral region of the femoral head leading to death of the osteoblast and osteocytes. It occurs as a result of various condition, commonly due to idiopathic variety, post traumatic, alcohol abuse and steroid induced [1]. It commonly affects young population of third to fifth decade and responsible for 5%-12% of hip replacements [2]. Affected hip is not able to bear compressive stresses and if not promptly treated, collapse leading to loss of sphericity of the head and secondary osteoarthritis may be the final scenario.

The head of femur is the most vulnerable bone affected by AVN. Pain around the hip and proximal thigh may be the first symptom. If active intervention is not done in due time, it may worsen gradually, affecting daily activities and eventually hip replacement procedures might be necessary [3].

Osteonecrosis or AVN of femoral head is associated with many etiological backgrounds, but the most common cause of this in our country is steroid intake. Though idiopathic and alcohol abuse cause is described as leading causes in many textbook but in our country, specially case reported in our hospital outdoor section, long term and even short term corticosteroid intake is the main etiology.

Increased intramedullary pressure is involved in the pathogenesis of AVN. CD decreases intramedullary pressure, removes some amount of necrotic tissue, and brings back revascularization to this ischemic area. This procedure may arrest or even reverse the progress of AVN before articular collapse and thus prevent secondary osteoarthritis. That is the reason, CD in early stages before collapse can effectively preserve the intact femoral head [4].

There are wide ranges of conservative treatment modalities available, but till now the management of AVN of femoral head remains controversial and challenging also. These includes non-steroidal anti-inflammatory drugs, bisphosphonates, hyperbaric oxygen therapy, and extra-corporal shockwave therapy, but their outcome is not so much satisfying [4]. But, surgical procedure like CD and varus osteotomy can preserve femoral head or at least delay the need of hip replacement procedures. That is the main reason femoral head preserving procedures should be considered in early stages of AVN in order to delay the arthroplasty and can permit floor level activities which is very much important for the people of our country like Bangladesh.

In this study, we only included steroid induced AVN of femoral head and analyzed the clinico-radiological outcomes after CD and non-vascularized fibular, autologus cancellous and allogenic bone grafting for comparison and evaluation.

Methods

This study includes total 28 hips of 20 patients which is small in number as all of this cases came from same etiological background, that is steroid induced AVN of femoral head and all of them were treated with CD and bone grafting in early stages of AVN. Our study includes cases from December 2015 to April 2022 that is why follow up period varies a lot with average follow-up period of 14.3 months.

Patients of 22-45 years with stage 1 to stage 2 of Ficat and Arlet ARCO stages 1 to stages 2C classification were included in this study. Other than steroid induced AVN, like post traumatic cases, alcohol abuse, Perthe's disease were excluded from the study. The diagnosis of steroid induced AVN were based on clinico-radiological investigations after brief history taking.

Total 28 hips of 20 patients were included in this study. The average age of the patients was 33 years (range 22-45 years). Fourteen males with 18 hips (64.29%) and 6 females with 10 hips (35.71%) were included in this study. Sex ratio was 2.3:1. Out of 28 hips, 18 hips had involvement of only left side (64.29%) with 15 hips only right side (53.57%) and 5 hips had bilateral involvement (17.86%).

A detailed history regarding age, sex, occupation, pain with intensities, duration and progression of symptoms, deformity, support requirement, any history of trauma or involvement of any other joint was recorded. History of duration and amount of steroid intake and time taken to appear symptom were also noted but not included here.

Some routine investigations of blood like- CBC, ESR, CRP, liver and kidney function test with X-ray pelvis including both hip joints, frog leg view and MRI of both hips for analysis and documentation of the amount of involvement of the femoral head, stages of the disease as well as to evaluate the status of the contralateral hip were done.

After explanation of the procedure and risk of operation informed consent was taken. Patients were operated in supine position in a C-arm compatible fracture table, where both leg attached with foot plate with adequate amount of traction applied to just hold both lower limb in static position. Counter traction maintained with perineal post or block. With maintaining all aseptic procedure, guide wire was inserted through lateral cortex one thumb distal to the tip of greater trochanter and directed towards the affected area under C-arm guidance. After confirming the position of the guide wires in both AP and lateral views, best wire that acquired right position was chosen then serial reaming with DHS reamer was done to reach and create hole towards sclerotic part with retaining the wire in the core central position. When sclerotic part was being reamed this gave a harder feeling and confirmed the affected area. The margins of the core created were curretted till normal feel of the bone achieved and position of the hole was confirmed with C-arm. The core thus created were filled with bone grafts. In 24 hips out of 28 hips (85.71%) autologus cancellous bone grafting harvested from anterior superior iliac crest and remaining 4 hips (14.29%) with non-vascularized fibular strut grafting were done to fill the space created.

These bone grafting have both osteogenic and osteo-induction properties which aids new bone formation. Here core decompression reduced marrow edema by drainage through these holes created. Types of bone grafting were different, which were chosen by the surgical team with consent of the patient after adequate explanation.

All of the patients were advised for strict non

weight bearing for at least 3 months, but hip range of movement exercises in bed were encouraged and carried out by the patients during hospital stay and after discharge from hospital.

Regular follow-up at an interval of 1,3 and 6 months post-operatively with yearly after that were advised and evaluated in most of the cases with clinico-radiologically with X-rays. MRI were done only in those cases that were not responding promptly, in 8 cases (28.57%). Follow-ups were done to evaluate and compare the outcomes of CD and bone graftings. Visual analog and Harris hip score (HHS) were judged during follow-up period, but only Harris hip score were included in this study.

Figure 1: Pre-operative X-ray of pelvis including both hips AP view on 14/11/21, where right hip in stage 2 and left hip in stage 3.

Figure 2: Pre-operative X-ray of pelvis including both hips in frog leg view on 14/11/21.

Figure 3: Post-operative X-ray of right hip after Core decompression and autologus cancellous bone grafting on 17/11/21.

Figure 4: Post-operative X-ray of left hip AP view after Core decompression and bone grafting on 15/12/21.

Figure 5: X-ray of pelvis including both hips AP view on first follow-up after one month on 11/01/22, in which right hip in in good condition but left hip showing no improvement.

Figure 6: X-ray of pelvis including both hips AP view on second follow-up after 3 months, where right hip in excellent condition but left hip is deteriorating with more collapse, which correlated with clinial condition.

Results

In this study, 24 hips out of 28 hips (85.71%) autologus cancellous bone grafting harvested from anterior superior iliac crest and remaining 4 hips((14.29%) with non-vascularized fibular strut grafting were done to fill the space created.

Table 1: Types of bone grafting after core decompression with percentage (n = 28).

Type of bone grafting	Number of hips with percentage
Autologus cancellous bone graft from ASIS	24 (85.71%)
Non vascularized fibular strut grafting	4 (14.29%)

In 5 hips (17.86%) out of 28 hips were in ARCO stage 1, 18 hips (64.29%) were in stage 2A, 4 hips (14.29%) were in stage 2B, 1 hip (3.57%) was in stage 2C. So, ARCO stage 2A is the most common stage in which patients presented to us.

In those cases, 5 hips (100% of this stage) out of 5 hips of ARCO stage 1, 14 hips (77.8% of this stage) out of 18 hips of stage 2A, 1 hip (25% of this stage) out of 4 hips stage 2B showed improvement but, 1 hip (100% of this stage) out of 1 hip of stage 2C showed no improvement. Out of these remaining 8 cases that showed no improvement, 5 cases (17.86%) clinically proven good. Total 3 hips (10.71%) gone through hip replacement surgery.

In follow-up (according to Harris Hip Score) 14 hips (HHS = 92.5%) had excellent (score range 90-100%), 8 hips (HHS = 84.6%) had good (score range 80-90%), 3 hips (HHS = 70.8%) had fair (score range 70-80%) and 3 hips (HHS = 54.2%) had poor (score range <69%) outcomes. These 3 hips of last group required further hip replacement surgeries and total 5 hips (17.86%) showed no deterioration or improvement radiologically, but clinically showed good result in follow-up till this study.

Table 2: Statistical profile of outcomes in Ficat-Arlet and ARCO classification system (n = 28).

Ficat and Arlet classification	ARCO classification	Number of hips with percentage	Outcomes with percentages of this stage
1	1	5 (17.86%)	5 (100% of stage 1) improvement
	2A	18 (64.29%)	14 (77.8% of stage 2A) improvement
2	2B	04 (14.29%)	01 (25% of stage 2B) improvement
	2C	01(3.57%)	01 (100% of stage 2C) no improvement

Table 3: Statistical profile of outcome in Harris hip scoring system (n = 28).

Harris Hip Score (HSS)	Number of hips	Percentage of HHS (%)
Excellent (>90)	14 hips	92.5
Good (80-89)	08 hips	84.6
Fair (70-79)	03hips	70.8
Poor (<69)	03 hips	54.2

Discussion

It has been already established and also found in our study that early diagnosis and treatment accordingly leads to better outcomes in AVN of the femoral head [3]. For early diagnosis purpose Ficat-Arlat and ARCO classification stage 0 and 1, diagnosis is only based on MRI findings. That is why, though various diagnostic modalities available till now, MRI stands out as the standard tool. Even pre-symptomatic stage (stage 0) where there is no change on plain radiographs [3], MRI can help or show early changes and thus help in early diagnosis.

Another important findings of our study is that, there is no difference between autologus cancellous bone grafting and autologus non-vascularized fibular grafting after CD. Total failure case were only 3 (10.71%) of ARCO, which needed hip replacement surgeries, but this were not related to type of bone grafting. One hip out of 4 hips (25%) suffered from post-operative superficial skin infection, but this case also belongs to that 3 hips group that needed hip replacement surgeries after control of infection.

There are many studies comparing the effectiveness of CD with bone grafting and studies with follow-up results of CD alone. But, there is no long term follow-up study.

Assessment of success rate of CD according to many studies is difficult to determine because of difference among studies with regards to selection of patient's stages of diagnosis, classification systems, operative procedures, post-operative management and evaluation of clinical outcomes in different duration of follow-up periods [5].

Babhulkar (2006) (n = 345 hips) reported to be very good in 95 hips (27.5%), good in 135 hips (39.1%), medium in 36 hips (10.3%), fair in 65 hips (18.8%) and poor results in 14 hips (4%) after femoral head preserving surgeries based on HSS [6]. Marker et al. (2008) (n = 52) reported the outcome of CD to be excellent results in 48%, good results in 13%, fair results in 1% and poor results in 38% [7]. Similar results were found by Shah et al. (2015) [8].

Stulberg et al. (1991) (n=55 hips) reported CD was succesful in 70% of Ficat and Arlat stage 1,2 or 3 whereas the results of the cases managed conservatively, was only 20% succesful in Ficat and Arlet stage 1, 0% in stage 2, 10% in stage 3 and concluded that CD is effective than conservative therapy [9]. His reports were also supported by Smith et al. (1995) (n=702 hips) [10]. Similar results were also reported by Mont et al. (1996) (n=1206 hips) [11]. Stein

berg et al. (1998) (n = 297 hips) reported after average follow-up of 24 months [12]. They reported 78% success in stage 1B, 2B and 2C. The results is similar to this study. Results that were reported by Stulberg et al. (1997) (n=36 hips) were 70% in stage 1, 71% in stage 2, 73% in stage 3 [13]. In the study of Mont et al. (1998) (n = 30 hips) 83% success rate was seen [14]. Boettcher et al. (1970) (n=55 hips) reported also similar results where 79% success was obtained [15].

Though common etiology described in most of the textbook which comprises idiopathic, alcohol abuse and steroid induced, our study only includes steroid induced AVN of femoral head, as this single etiology is commonest finding in our country. Alcohol abuse is relatively rare in socio-religious prospectus of our country. Most of the patients especially female patients took steroid in a faith to improve their mal-nourished body. Rest of the patients gave history of steroid intake as a part of their musculo-skelstal and joint pain management, but they were unaware of the category or therapeutic class of the steroid and its side effects.

Moreover alcohol, corticosteroids, immuno-suppressives and cytotoxic drugs, either singly or in combination are the commonest causes of non-traumatic AVN of bone, commonly femoral head. Maximum dose of corticosteroid causing osteonecrosis or AVN have not been established. This consequence not only depend on dose but also duration, type of corticosteroid, additive factors can almost always be identified. Recently 'long COVID-19' and use of corticosteroid as a part of its management is under evaluation as an etiology of AVN.

Conclusion

In early stages like stage 1 and stage 2 of AVN of femoral head, CD with bone grafting gives satisfactory result which can delay the progression of the disease, save femoral head from collapse, secondary arthritis and thus may lessen the burden of hip replacement surgeries, which is costly and brings limitation in our day to day floor level activities. Many other studies including our study suggest that CD and bone grafting may provide satisfactory result in early stages of AVN of femoral head.

Study limitation

To assess the outcome of the procedure, long term results of larger sample from different etiology to be evaluated in multi-centric level in order to reach the final conclusion.

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Original Article

Biochemical Markers of COVID-19 Patients and its Association with Comorbidities

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Abstract

Introduction: The outbreak of COVID-19 has been causing worldwide health concerns and it is now the number one epidemic in the history of the world. Since then, it has become a great challenge to health care systems. Studies have evaluated that, some biochemical parameters as well as comorbidities of patients are associated with disease severity of COVID-19. The aim of our study was to reveal a correlation between biochemical parameters such as blood glucose, serum creatinine, d-dimer, ferritin of COVID-19 patients and its association with co morbidities. **Methods:** This cross sectional analytical study was conducted in department of Biochemistry of Shaheed Syed Nazrul Islam Medical College Hospital, Kishorganj, Bangladesh. We enrolled 136 RT-PCR confirmed COVID-19 patients from Corona Isolation Unit from November 2020 to January 2021. We had collected history of comorbid conditions and biochemical parameters of the patients from individual clinical records of the patients which included plasma glucose, serum ferritin, serum creatinine, D-dimer and C-Reactive Protein (CRP). The clinical syndrome of COVID -19 was divided as mild, moderate, severe and critical case according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh. Patients were divided into two groups according to presence of their comorbidities and comparison of the biochemical parameters between the groups was searched in this study. **Results:** Total 136 subjects were included in the study, out of them 89 study subjects had comorbidities and 47 had no comorbidities. Mean ± SD of D-dimer, CRP and serum ferritin were 1.28 ± 1.83 (mg/L), 42.38 ± 58.75(mg/L) and 595.13 ± 598.14 (ng/ml) respectively in comorbid patients. Among the 89 comorbid patients, D-dimer (36%), CRP (47%) and serum ferritin (24%) were elevated. **Conclusion:** In our study we did not found any significant difference of biochemical markers between comorbid and non-comorbid COVID-19 patients. But according to the clinical classification of COVID-19 disease only D-dimer was found significantly associated with severe COVID-19 disease.

Keywords: Biochemical markers, COVID-19 patients, comorbidity.

Introduction

Coronavirus disease (COVID-19), the latest outbreak caused by 2019-nCoV/SARS-CoV-2 has spread rapidly worldwide [1]. Being first identified in Wuhan, China, it was officially named the Coronavirus Disease 2019 (COVID-19) by the World Health Organization (WHO) on February 11, 2020 [2]. Approximately 79% homology of SARS-CoV-2 matches with the Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and 50% with Middle East Respiratory Syndrome Coronavirus

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(MERS-CoV) [3]. Despite the effort to control the transmission of COVID-19, the infection spread to at least 114 countries, and due to rapid escalation of case numbers ensued worldwide, WHO has declared COVID-19 pandemic on 11 March 2020 [WHO, COVID-19 Situation Report-78] [4,5]. COVID-19 patients may be asymptomatic or have mild infection to severe respiratory tract infections as those seen in severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). COVID-19 patients usually present with fever, coughing, dyspnea, watery diarrhea, myalgia, severe lymphopenia, prolonged coagulation profiles, cardiac disease and sudden death [6, 7]. Complications include pneumonia in both lungs, respiratory failure that may require mechanical ventilation and support of an intensive care unit (ICU) and may show multi-organ involvement and systemic manifestations in the form of sepsis, septic shock, organ failure and death [8]. Since the emergence in Wuhan in December 2019, COVID-19 has spread rapidly in Americas, Europe, Eastern Mediterranean, South-East Asia, and Africa [9]. COVID-19 had spread to Bangladesh; as The Institute of Epidemiology, Disease Control and Research (IEDCR) reported the first three known cases on March 8, 2020 on March 2020 [10]. According to WHO 52,848,261 people have been confirmed globally with COVID-19 and 1,280,868 million people have died (up to November 12, 2020). In Bangladesh between 8 March and 09 November, according to the DGHS press release there were 412,921 COVID-19 cases confirmed by RT-PCR including 6,092 deaths and Bangladesh is the top 22th country in the world.

The recognized risk factor for severe disease is old age and underlying co-morbidities particularly diabetes, cardiomyopathy, chronic renal failure, chronic obstructive pulmonary disease. The fatality rate is also high [11]. Studies showed that diabetic patients have been linked to more hospitalization and ICU admissions and morbidity and mortality rate is high as well; the risk of COVID-19 with COPD is found four-fold higher than patients without COPD [12, 13]. As patients with co-morbidities usually have the worst prognosis all necessary precautions should take to avoid getting infected with SARS CoV-2 [14]. That is why the biochemical parameters can help to assess the severity of SARS-CoV-2 for co-morbid patients.

The aim of this study was to observe a correlation between biochemical parameters such as d-dimer, ferritin, CRP of COVID-19 patients and its association with co-morbidities to identify severe or critical patients early which can help us reducing the mortality of COVID-19 infected patients. Moreover, to the best of our knowledge no such type of study was done in our country.

Methods

It was a cross sectional analytical study. We enrolled 136 confirmed COVID-19 patients from Corona Isolation Unit of Shaheed Syed Nazrul Islam Medical College Hospital, Kishoreganj which was a designated center prioritized in treating critical illness in Kishoreganj, Bangladesh, from November 2020 to January 2021. Confirmed cases were defined by epidemiological history and microbiological evidence (respiratory specimen positive for SARS-CoV-2 by real time reverse transcription polymerase chain reaction (RT-PCR) from RT-PCR laboratory of Shaheed Syed Nazrul Islam Medical College, Kishorganj, Bangladesh). The assays were performed using a nucleic acid diagnostic kit (PCR-Fluorescence probing) for the qualitative detection of the ORF1ab and a specific conserved sequence of coding nucleocapsid protein N genes of novel corona virus (2019-nCOV) according to Sansure SARS-CoV-2 kit, supplied by DGHS of Bangladesh. We had collected demographic informa-

tion, clinical manifestations, history of co-morbid conditions (diabetes, coronary artery disease, chronic kidney disease, and chronic obstructive pulmonary disease) and biochemical parameters of the patients from individual clinical records of the patients which included plasma glucose, serum ferritin, serum creatinine, D-dimer and C-reactive protein (CRP). The clinical syndrome of COVID-19 was divided as mild, moderate, severe and critical case according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh. Patients were divided into two groups according to presence of their co-morbidities (with or without co-morbidities). We wanted to compare the biochemical parameters between the groups. Statistical analysis related with this study was performed by use of SPSS 22.0 package program. Results were expressed as mean ± SD. Comparison was done by unpaired t-test, Chi-square test and Fisher's exact test. A p-value of <0.05 was considered as statistically significant.

Results

Total 136 subjects were included in the study, out of them 89 study subjects had comorbidities and 47 had no comorbidities and the mean age was 57.6 ± 14.3 and 45.7 ± 15.3 years respectively. Table I shows the distribution of age of the COVID-19 patients (n = 136) and its association with co-morbidity. Distribution of the study subjects on the basis of comorbidity are shown in the bar diagram (Figure I). Clinical classification of COVID-19 patients in two groups are shown in bar diagram (Figure II). Table II is showing the association of biochemical marker with co-morbidity of the COVID 19 patients and here no significant difference found in groups. Table III is showing comparison of the frequency percent of biochemical markers among the COVID-19 patients. Comparison of biochemical parameters according to clinical classification of COVID-19 patients has shown in Table IV.

Table 1: Distribution of study subjects according to age of the COVID 19 patients (n = 136).

Age (years)	Comorbidity		*p* value
	Present n (%)	Absent n (%)	
21 – 30	3 (3.4)	10 (21.3)	
31 – 40	10 (11.2)	10 (21.3)	
41 – 50	13 (14.6)	9 (19.1)	
51 – 60	29 (32.6)	10 (21.3)	<0.001
61 – 70	21 (23.6)	6 (12.8)	
>70	13 (14.6)	2 (4.3)	
Mean ± SD	57.6 ± 14.3	45.7 ± 15.3	

Unpaired t test was done.

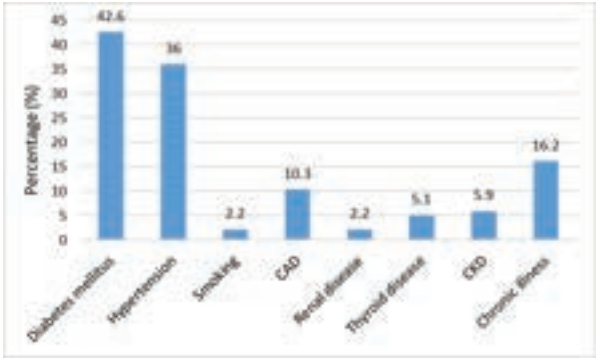

Figure 1: Comorbidities of the COVID-19 patients (n = 136).

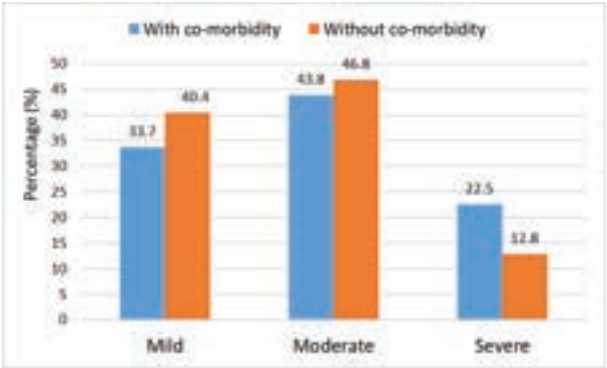

Figure 2: Association of severity of the disease with co-morbidity of the COVID-19 patients (n = 136).

Table 2: Association of biochemical marker with comorbidity of the patients (n = 136).

Biochemical marker	Comorbidity		*p* value
	Present Mean±SD	Absent Mean±SD	
D-dimer (mg/L)	1.28 ± 1.83	2.28 ± 3.35	0.440
CRP (mg/L)	42.38 ± 58.75	41.52 ± 83.04	0.327
S. creatinine (mg/dl)	1.40 ± 0.73	1.24 ± 1.19	0.004
S. ferritin (ng/ml)	595.13 ± 598.14	732.57 ± 641.78	0.541

Mann-Whitney U test was done.

Table 3: Comparison of the frequency percent of biochemical markers among the COVID-19 patients (n = 136).

Biochemical marker		Comorbidity		*p* value
		Present n (%)	Absent n (%)	
D-dimer (mg/L)	<0.5	24 (40)	10 (38.5)	0.893
	≥0.5	36 (60)	16 (61.5)	
CRP (mg/L)	<5	1 (2.1)	0 (0)	1
	≥5	47 (97.9)	20 (100)	
S. ferritin (ng/ml)	<300	14 (36.8)	7 (38.9)	0.883
	≥300	24 (63.2)	11 (61.1)	

Chi-Square test was done.

Discussion

The outbreak of COVID-19 has been causing worldwide health concerns and it is now the number one epidemic in the history of the world. The mortality rate in critically ill patients with COVID-19 is high and now it is a great challenge for the clinician to reduce mortality. In this study we have analyzed biochemical parameters of COVID-19 infected comorbid patients as well as non-comorbid patients. We have done a cross sectional analytical study in the department of Biochemistry of Shaheed Syed Nazrul Islam Medical College, Kishoreganj, Bangladehs from November 2020 to January 2021. We have enrolled 136 RT-PCR confirmed COVID-19 patients in this study. The clinical syndrome of COVID-19 were divided as mild, moderate, severe and critical case according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh. Patients were divided into two groups according to presence of their co-morbidities (with or without comorbidity). We wanted to see the association of biochemical parameters between the groups.

Among the co morbidities associated with COVID-19 in our study, diabetes mellitus, and hypertension were most common 42.6% and 36.0% respectively (Figure I). Bajgain et al. (2020) reported hypertension followed by diabetes and cardiovascular diseases were the most common comorbidity seen in COVID-19

Table 4: Comparison of biochemical parameters with disease severity according to clinical classification of COVID-19 patients (n = 136).

Biochemical marker	Comorbidity			*p* value
	Mild (n=49)	Moderate (n=61)	Severe (n=26)	
FPG (mmol/L)	8.89 ± 4.33	10.95 ± 4.25	9.25 ± 4.42	0.521
Serum Ferritin (ng/ml)	479.90 ± 409.90	628.30 ± 589.68	762.31 ± 739.23	0.442
C-Rective Protein (mg/L)	20.97 ± 25.84	46.00 ± 72.79	65.53 ± 85.91	0.107
D dimer (mg/L)	0.79 ± 0.92	1.10 ± 1.67	3.30 ± 3.62	<0.001*

p value reached from ANOVA test, *significant

positive patients across major epicenters world-wide [15]. Ghweil et al. (2020) also reported similar findings [16]. Bajgain et al. (2020) also reported having one or more comorbidity is linked to increased disease severity and no clear association was found by them between having these risk factors and increased risk of fatality [15]. In our study revealed that severe COVID-19 disease was more frequent in patients with comorbidity (Figure2).

According to Wang et al. (2020) in severe disease of Covid19 the biochemical parameters such as C-reactive protein > 64.79 mg/L, D-dimer > 0.96 ug/mL should be observed carefully to prevent critical stage [17]. In our present study Mean ± SD of D-dimer, CRP and serum ferritin were 1.28 ± 1.83 (mg/L), 42.38 ± 58.75 (mg/L) and 595.13 ± 598.14 (ng/ml) respectively in comorbid patients and in patients without comorbidity were 2.28 ± 3.35 (mg/L), 41.52 ± 83.04 (mg/L) and 732.57 ± 641.78 (ng/ml) respectively (Table II). Among the 89 comorbid patients, D-dimer (36%), CRP (47%) and serum ferritin (24%) were elevated (Table III). Yao et al. (2020) found similar findings [9]. They reported D-dimer elevation (≥ 0.50 mg/L) was seen in 74.6% (185/248) of the patients. D-dimer is commonly elevated in patients with COVID-19. D-dimer levels correlate with disease severity [9]. In a meta-analysis Huang et al. (2020) showed that an elevated serum CRP, PCT, D-dimer, and ferritin were associated with a poor outcome in COVID-19 [18]. In our study we did not found any significant difference of biochemical marker between two groups. But according to the clinical classification of COVID-19 disease D-dimer was significantly raised among the other biochemical markers.

Conclusion

From the above study it could be concluded that, D-dimer levels were commonly elevated in patients with COVID-19 infection and significantly higher levels are found in those with severe COVID-19 disease.

Limitations of the study

The limitation was we could not collect all the biochemical markers of all patients. We just collected the data from the hospital records. So, we could not correlate all the parameters. We have to depend on the treatment protocol and have to consider the financial condition of the patients. If we could collect blood sample from the patients and do all biochemical tests, we could understand the actual picture.

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Original Article

Clinical presentation of Preauricular Sinuses: Our Experience

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Abstract

Introduction: Preauricular sinuses are congenital malformations that usually occur at anterior margin of the ascending limbs of the helix of the external ear. It usually presents as a small opening in the skin anterior to the insertion of the helix. It is usually asymptomatic unless it gets infected. **Objective:** Purpose of our study was to evaluate variety of clinical presentations of preauricular sinuses attending in a district level hospital. **Methods:** The present study was a prospective observational type of study conducted in District Hospital, Satkhira from January 2015 to December 2017. Convenient non-randomized purposive sampling technique was applied. All patients with clinical diagnosis of preauricular sinus were enrolled in the study. **Results:** A total of 43 patients were enrolled in this study. Majority of the patients were female 70.27% (25) with mean age of presentation was 9.2 ± 5.3 years. Majority of the patients were unilateral, 86.0% (37) with right predominance 56.8%. Majority of the patients, 88.4% (38) presented with classical type preauricular sinuses. Majority of the patients 31 (72.1%) were symptomatic with variable presentation. Of them pain and swelling without abscess formation was the most common presentation 8 (18.6%). **Conclusion:** Preauricular sinuses are usually asymptomatic congenital malformations which are not age and sex matched with minimal complication.

Keywords: Preauricular sinus.

Introduction

Preauricular sinuses are congenital malformations that usually occur at anterior margin of the ascending limbs of the helix of the external ear [1-3]. It is also termed as preauricular pit, preauricular fistula, preauricular tract and preauricular cyst. It was first described by Heusinger in 1864 [4].

The incidence is between 0.1% and 0.9% in Europe and the United states, 1.6% - 2.5% in Taiwan and reaches 4-10% in some regions Asia and Africa [1, 3, 4]. It usually presents as a small opening in the skin anterior to the insertion of the helix. A tract from this opening runs inward and it is usually lined by squamous epithelium [5]. The opening has also been reported along the postero-superior margin of the helix, the tragus or the lobule [6]. Preauricular sinus may lead to the formation of a subcutaneous cyst that is intimately related to the tragal cartilage and the anterior crus of the helix. The sinus course, in preauricular subcutaneous tissues is not constant. The visible pit may represent the full extent of the deformity or mark a sinus tract that can vary in length, branch and follow a tortuous course. Topographically, the sinus is

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located more superficially than the temporalis fascia, laterally and superiorly from the parotid gland and facial nerve in contrast to the tract of an anomaly of the first branchial cleft, which tends to be intimately related to these structures. In all cases, part of the tract blends with the perichondrium of the auricular cartilage [7].

Hereditary play part in its development but it may be sporadic [8-10]. Over 50% of cases are unilateral and most often sporadic. Bilateral cases are more likely to be inherited by incomplete autosomal dominance with reduced penetrance (nearly 85%). Researchers in China have mapped a possible locus for congenital preauricular fistula to chromosome 8q11.1-q13.3 by linkage analysis of a family comprising affected and non-affected members [10]. The preauricular sinuses have been described as part of a number of syndromes and associations with renal or inner ear anomalies.

Developmentally, the external ear develops from six eminences on the mandibular and hyoid margin of the first branchial cleft. Failure of the tubercles to fuse with each other or failure of some of these tubercles (hillock) to grow normally may produce a variety of external ear malformation such as preauricular sinus [2, 3, 11].

The cutaneous pit of the pre-auricular sinus is most often located on or near the ascending limb of the helix but can also open along the postero-superior margin of the helix as well as the tragus and lobule [12]. While both cutaneous opening and fistulous tracts are classically located anterior to the external auditory canal, a reported ‘‘variant type’’ has its opening behind an imaginary vertical line drawn at the posterior most aspect of the tragus and the posterior aspect of the ascending limb of the helix [13]. Choi et al. (2007) reported that the ‘‘variant type’’ of pre-auricular sinus comprised 10.9% of pre-auricular sinus, that all fistulas were located on the ascending helix, and that the fistulous tract was directed postero-inferiorly [13].

Preauricular sinus is usually asymptomatic unless it gets infected. Preauricular sinuses are prone to infection leading to preauricular sinus abscess. Infections are usually caused mainly by *Staphylococcus aureus* and less commonly by *Streptococcus* and *Proteu* [8]. These leads to irritation, fluid drainage, oedema, pain and when the sinus opening is blocked pus accumulate leading to abscess formation. It may also be complicated by spreading to contiguous structures such as the pinna, temporomandibular joint and external auditory canal.

Clinical presentations of preauricular sinuses are usually recurrent discharge, pain, swelling, itching, headache and fever. Other congenital anomalies such as hearing loss or renal problem of 1.7% and 2.6% respectively are usually associated preauricular sinus [1]. Preauricular sinus is commonly mistaken for pimples (blackheads), furunculosis, chronic infection such as tuberculosis and fungal also congenital condition such as dermoids and sebaceous cysts [14].

Purpose of our study was to evaluate variety of clinical presentations of preauricular sinuses attending in a district level hospital.

Methods

The present study was a prospective observational type of study conducted in District Hospital, Satkhira from January 2015 to December 2017. Convenient non-randomized purposive sampling technique was applied. A total of 43 patients were enrolled in the study. Written informed consent was taken from the patients or their guardians before their enrollment in the study. All patients with clinical

diagnosis of preauricular sinus were enrolled in the study. Both males and females of all ages were included. Those who refused to be enrolled and those who refused to do investigations for evaluation were excluded from the study.

Detail histories of presenting complaints were taken particularly with previous history of any infection or operations were noted. Family history of same anomaly was also taken. Detailed otologic, nasal, throat and head-neck examinations were performed on all the cases. Site of the sinus including their laterality was noted. Surrounding area was examined for any swelling, tenderness was elicited and palpation was done to express any discharge from the sinus opening. Full general examinations were done to rule out associated congenital anomalies. Hearing assessment with pure tone audiometry and tympanometry were performed to assess the hearing status. In addition, abdomino-pelvic ultrasound scan was performed in all cases to rule out congenital renal anomalies.

All data were noted in a data collection sheet and analyzed using Microsoft excel. Continuous variables were stated by mean values. The quantitative findings were mentioned by frequencies and percentages.

Results

A total of 43 patients were enrolled in this study. Majority of the patients were female 70.27% (25) with mean age of presentation was 9.2 ± 5.3 years (Table 1). Majority of the patients were unilateral, 86.0% (37) with right predominance 56.8% (Table 2). Majority of the patients, 88.4% (38) presented with classical type preauricular sinuses (Table 2). Majority of the patients 72.1% (31) were symptomatic with variable presentation. Of them pain and swelling without abscess formation was the most common presentation 8 (18.6%). Preauricular scar was noted in 7 (16.3%) cases which was the second most presenting feature (Table 3).

Table 1: Demographic characteristics of study patients (n=43).

Age (years)	Range	1-30
	Mean Age of Presentation	9.2 ± 5.3
Gender	Male n (%)	18 (29.73)
	Female n (%)	25 (70.27)

Table 2: Characteristics of opening of the sinuses (n=43).

Characteristics		**Frequency** n (%)
Laterality	**Unilateral**	**37 (86)**
	Right	21 (56.8)
	Left	16 (43.2)
	Bilateral	**6 (14)**
Types	Classical Type	38 (88.4)
	Variant Type	5 (11.6)

Table 3: Distribution of study patients by presentation (n = 43).

Presentation	**Frequency** n (%)
Asymtomatic	**12 (27.9)**
Aware with Seeking Care	5 (11.6)
Aware but not Seeking Care	4 (9.3)
Unaware (Diagnosed Incidentally)	3 (7)
Symptomatic	**31 (72.1)**
Swelling around Sinus Opening	5 (11.6)
Recurrent purulent drainage from opening	3 (7)
Pain and swelling without abscess formation	8 (18.6)
Pre auricular abscess formation	3 (7)
Post auricular/sub-auricular abscess formation	4 (9.3)
Pre-auricular scar	7 (16.3)
Post-auricular/sub-auricular scar	1 (2.3)

Discussion

Preauricular sinuses are congenital malformations that usually occur at anterior margin of the ascending limbs of the helix of the external ear. It usually presents as a small opening in the skin anterior to the insertion of the helix. It is usually asymptomatic unless it gets infected. The present study was a prospective observational type of study conducted in District Hospital, Satkhira from January 2015 to December 2017. A total of 43 patients were enrolled in this study. Purpose of our study was to evaluate variety of clinical presentations of preauricular sinuses.

Preauricular sinus is a congenital malformation, which usually manifest during childhood or early in life as in majority of our studied patients. Majority of congenital anomalies were known to be symptomatic during childhood. As in other studies, preauricular sinus was predominantly found in children in our study [1]. It may be as a result of more attention parents give to their children's health condition.

This congenital malformed ear tubercle leaves a blind tube which once infected, will harbor infected agent. This is responsible for high rate of infection of preauricular sinus and abscess formation, (31) 72.1% cases in this study which is similar to Jimoh et al. (2008) study in Ilorin, Nigeria.

The preauricular sinus affects both sexes in this study like in other studies. The proportion varies from different studies and race. Some studies show that men and women were equally affected [16-18]. Some works support women to be predominantly affected [18-21]. Jimoh et al. (2008) study revealed a male preponderance [15]. This study revealed high proportion 70.27% (25) of preauricular sinus in female. This may be due to facial make up and cosmetic usage in women.

In our study, affectation of the right ear 21 (56.8%) is commoner in our study than the left 16 (43.2%). Other studies also establish commoner unilateral and higher right ear cases [3, 21]. Common clinical presentations of this condition are discharge, erythema, and preauricular swelling [1]. This finding is similar to our finding of swelling in front of ear, recurrent discharge and earache. Single or recurrent infection leads to the complication findings in this study such as ear discomfort, cellulitis, perichondritis, hypertrophic scar as well as keloid.

In our study unlike other studies, no case of hearing impairment or renal disorder was detected. This may be due to the number of cases studied. Some other studies also revealed syndromes association with preauricular sinus [22, 23]. Hearing impairment was found to be 8/1000 among infants with preauricular skin tags or ear pits in a study done by Roth et al. (2008) [22]. Common errors are made in the diagnosis of preauricular sinus. This could be due to scanty report and low information in the literature on preauricular sinus. This could also be due to higher percentage of asymptomatic cases [14].

Conclusion

From the above study it could be concluded that, preauricular sinuses are usually asymptomatic congenital malformations which are not age and sex matched with minimal complication. Site of the sinus opening are usually in the classical position but atypical site of sinus opening is not uncommon.

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