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Chattagram International Dental College Journal requires authors to declare any competing financial or other interest in relation to their work. Where an author gives no competing interests, the listing will read the author (s) declare that they have no competing interests.

Self Medication Antibiotics : Bangladesh Perspective

Md. Saiful Hoque^{1*} Tahmina Akter Chowdhury²

Self medication can be defined as the self consuming of medication without getting advice from a physician for either diagnosis or treatment. On the other hand-self medication is a human behavior in which an individual uses a substance or any exogenous influence to self administer treatment for physical or psychological ailments. The most widely self medicated substances are Over The Counter (OTC) drugs and dietary supplements which are used to treat common health issues at home. Self treatment may lead to several health problems : Misuse of OTC medication, concurrent use of several medications and use of home remedies to treat potentially serious diseases, which may lead to misdiagnosis or masking of potential health problem. It is needless to say that, self medication and misuse of antibiotic is a global phenomenon. It is an increasingly serious threat to global public health that requires action across all government sectors and society. This misuse of antibiotics has developed of antibacterial resistance coinciding with the increases in drug resistant organisms which may result in the use of more toxic drug. However, specially antibiotic self medication is highly prevalent in the developing countries due to easy availability and poor regulatory controls for selling antibiotic.

Although slaughterous, self medication with antimicrobial compounds is an extremely ubiquitous practice in developing countries for reasons of cultural tradition, convenience, accessibility, perceived savings and other benefits, with poor adherence being an ever-present consequence of self medication. The arsenal of antibiotics may be used up quickly, leaving the patient vulnerable to drug resistant infections. Treatment of bacterial infections in the hospital and community has been altered drastically over the past few decades with the emergence of pathogenic organisms that are no longer susceptible to our most commonly prescribed antibiotics. There is a clear relationship between the amount of a given antibiotic used

and the incidence of bacterial resistance. Resistance to commonly used antimicrobial drugs is remarkably high in countries where antibiotics are not restricted. Increasing rates of antimicrobial resistance have left clinicians with limited drug options for the treatment of bacterial infectious diseases. This is a major public health concern worldwide, especially in developing countries where higher rates of resistant bacterial infections persist. Antibiotic resistance in developing countries causes a catastrophic increase in the medical and socio economic burden of untreatable infectious diseases.

There is already enough evidence of growing resistance to antimicrobials in Bangladesh resulting from misuse of antibiotics. Because the misuse and abuse of antibiotics is a major cause of antimicrobial resistance, research is needed to evaluate the specific antibiotic usage patterns that are prevalent in developing countries so that interventions can be developed and implemented. For such interventions to be effective, we must also understand the underlying socio-cultural factors that contribute to antimicrobial misuse and the subsequent amplification of resistance in human populations. There is no prescription-only drug in Bangladesh, people can purchase drugs like sedatives, antimicrobials without prescription even in the remote parts of the country. In Bangladesh, the prevalence of self medication is thought to be high, usually attributed to the fact that most drugs can be obtained from the pharmacies without prescription. As a result, minor illnesses are treated with antimicrobials which have a potential to harm the individual as well as the society at large.

In conclusion self medication antibiotics is a relatively frequent problem in the Bangladesh. Drug Administration of Bangladesh should implement the regulatory controls immediately on the distribution and selling of antibiotics in order to reduce the frequency of antibiotic misuse following the guidelines of National Drug Policy-2005 as well as to ensure the punishment for the persons who violate the regulations.

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Neonatal Disease Profile and Outcome at A Non-SCANU District Hospital in Chattogram Hill Tracts, Bangladesh

Farid Ahmed^{1*} Mohammad Abu Morshed¹ Fatema Begum¹ Nargis Sultana²

Abstract

Background: Government of Bangladesh initiated the Special Care Newborn Units (SCANU) in 2011 at selected district hospitals followed by its scale up in other districts with support from UNICEF and other partners. However, to date SCANU had not been established in Rangamati General Hospital (RGH) Bangladesh. This study aimed to describe the diseases pattern and outcome of the neonates admitted in RGH.

Materials and methods: This retrospective analytical study included 325 neonates admitted during July 2020 to December 2020. Data regarding demographic, obstetric, disease pattern, and outcomes were extracted from the hospital register by using a structured case record form.

Results: The ratio between male and female was 1.6:1, 52% of the neonates admitted at first day of life. The reasons for admissions were 30.5% of neonatal jaundice, 26.2% preterm and low birth weight, 22.8% perinatal asphyxia, 22.2% prematurity, 8.9% neonatal sepsis, and 3.1% for pneumonia. Out of all neonates survival rate was 78.5% (225), while 2.5% (8) ended with fatality, 15.1% (49) were referred to tertiary level hospital and 4% (13) were left the hospital against medical advice.

Conclusion: It is concluded from this study that optimal neonatal case service cannot be ensured without establishing a neonatal ward or unit but for that one needs to have a fully equipped and adequately staffed neonatal unit.

Key words

Disease profile; Outcome; Neonate.

Introduction

Neonatal mortality is an influential part of overall child mortality. A specific target of less than 12 neonatal deaths per 1000 live births in 2030 was included in the SDG.¹ There was a 3.1% decline in neonatal deaths between 2000 and 2015 in Bangladesh and this rate of improvement would need to be maintained for achieving the child mortality target.² Although Bangladesh has substantially reduced neonatal mortality since 1990, increased efforts to improve progress are still needed to achieve the SDG target by 2030.³

To accelerate the reduction in neonatal mortality, SCANU have been started since 2011 at few selected hospitals.⁴ These SCANUs have been scaled up by the government of Bangladesh with support from UNICEF and other partners.^{5,6} However, to date the RGH had no SCANU. The neonates were managed in the general ward. This study

was undertaken to describe the disease pattern and mortality rates of the admitted neonates in the hospital. To improve the hospital care of neonates it is imperative to know the disease pattern and their outcomes in the hospital setting.

Materials and methods

This retrospective analytical study was conducted during July 2020 to December 2020. Ethical approval was taken from the ethical review committee of Rangamati Medical College. As the data collected retrospectively and did not contain personal information there was no need of informed consent of the legal representative of the neonates.

The study included 325 neonates admitted during July 2020 to December 2020. Both inborn and out born with in this period were included in this study. Neonates, who were kept under observation, including those referred from other facilities with suspected disease but labeled healthy after evaluation in the ward were excluded from the study.

Data were collected from the medical records stored in the hospital record room and admission and discharge registrar of ward. Using a structured case record form, data including age and sex, weight and gestational age on admission, place, and mode of delivery, cause of admission, duration of hospital stay and outcomes (Discharge, death, referred or left against medical advice) were collected.

All statistical analyses were performed in SPSS version 23.0. Data were analyzed through Descriptive statistics (Frequency, percentage) only.

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Results

During the study period, 325 neonates were admitted in the study hospital. Male admissions were more (61.2%) than female (38.8%). Maximum admissions were on the 1st day of life (52%), followed by 2-7th day (32%). Inborn neonates were more than the out born. Most of the neonates were delivered in health facilities and by vaginal deliveries (Table I).

Table I Demographic Characteristics of the admitted neonates at RGH

Variables	Frequency	Percentage (%)
Age at admission, days		
0-1	169	(52.0)
2-7	104	(32.0)
8-14	25	(7.7)
15-28	27	(8.3)
Sex		
Male	199	(61.2)
Female	126	(38.8)
Ethnicity		
Bangali	189	(58.2)
Tribal	136	(41.8)
Source		
Inborn	238	(73.2)
Out born	87	(26.8)
Gestational age		
Preterm	90	(27.7)
Term	235	(72.3)
Number of gestations		
Single	317	(98.1)
Multiple	6	(1.9)
Place of delivery		
Home	85	(26.2)
Hospital	240	(73.8)
Mode of delivery		
Vaginal	238	(73.2)
Cesarean	87	(26.8)

In Table II, about neonatal disease pattern of total 325 neonatal babies, neonatal jaundice was the major causes, following preterm low birth weight, perinatal asphyxia, prematurity, neonatal sepsis, pneumonia, hypothermia, respiratory distress syndrome, and birth trauma.

Table II Cause of neonatal admission at RGH (n=325)

Diagnosis	Frequency	Percentage (%)
Neontal Jaundice	99	30.5
Preterm Low birth weight	85	26.2
Perinatal asphyxia	74	22.8
Prematurity	72	22.2
Neonatal sepsis	29	8.9
Pneumonia	10	3.1
Hypothermia	10	3.1
Respiratory distress syndrome	8	2.5
Birth trauma	5	1.5

Included multiple responses.

Table III shows that, more than half of the admitted neonates (56.6%) stay in the hospital for 3-7 days. The length of hospital stay was similar in both groups ($p=0.401$). The overall death was 8 (2.5%), discharged from hospital 255 (78.5%), the hospital Left Against Medical Advice (LAMA) 13 (4.0%) and referred to other hospital 49 (15.1%). Most of the babies with life threatening surgical condition that requires immediate interventions, also severe RDS that require CPAP or ventilator management were referred.

Table III Outcome of neonatal admission at RGH

Outcome parameters	Frequency	Percentage (%)
Length of stay		
≤ 2 days	123	(38.9)
3-7 days	179	(56.6)
>7 days	14	(4.4)
Admission outcome		
Improved & discharged	255	(78.5)
Leave against medical advice	13	(4.0)
Expired	8	(2.5)
Referred to higher center	49	(15.1)

Discussion

As there was no separate neonatal ward or unit in the 150 bed General Hospital, Rangamati, neonates were treated in general ward. This retrospective analytical study was conducted targeting neonates admitted this hospital for consecutive four months period. During this period, a total of 325 neonates has been admitted in the hospital, among them 61.2% were male with a male to female ratio of 1.6:1. The male predominance, in this study, is also consistent with other studies conducted in Bangladesh, Pakistan, India, and Ethiopia.⁷⁻⁹ This indicates that male neonates are more vulnerable during the neonatal period, this might be due to higher biological survival rate of girls in the neonatal period. Additionally, cultural and social factors could also contribute to male babies getting more attention by parents than females.

Pattern of admissions indicates that bulk of the problems encountered by the neonates are on the 1st day of life and then there is a gradual decline in admission rate with increasing age of the baby, which was also similar to other studies.⁷⁻¹¹ Inborn neonates were more in the present study, which agreed to the study of Uppal et al which showed inborn and out born admission rates were respectively, 69.2% and 30.8%.¹²

Main causes of admission was neonatal jaundice, following preterm low birth weight, perinatal asphyxia, prematurity, neonatal sepsis, pneumonia, hypothermia, respiratory distress syndrome, and birth trauma. The high rate of neonatal jaundice and preterm low birth weight baby and low rate of RDS was consistent with other studies conducted in Bangladesh.^{10,11}

The death rate in our study is 2.5% which is lower than the previous recent studies (10%-3.6%) done in different centers in Bangladesh.⁷⁻¹¹ Death rate of any neonatal medical care unit depend upon various factors aside from the clinical condition of the baby like the infrastructure, manpower and trained person on duty, etc. Hence the death rate reports vary widely in several studies from different regions. Most of the cases who Left Against Medical Advice (LAMA) in general ward would have probably ended up in death, therefore, the high rate of LAMA in general ward gives a false impression of low mortality.

Limitation

The study has certain limitations. Duration of study period was short to determine the seasonal variation on the overall outcome of the neonatal admission. Moreover, retrospective design was associated with selection bias and misclassification bias.

Conclusion

It is concluded from this study that neonatal mortality was low in the study site and the commonest cause of neonatal admission was neonatal jaundice and preterm low birth weight baby. However, more than one fifth of the admitted neonates either had LAMA or referred to higher center, or expired.

Recommendation

Neonatal mortality and quality service without the need for referral cannot be ensured without establishing a fully equipped and adequately staffed neonatal unit.

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All the authors pay their thanks to all staff of SCANU.

Disclosure

The authors declared no competing interest.

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Laparoscopy and Laparotomy in the Surgical Management of Ectopic Pregnancy

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ABSTRACT

Background: Ectopic pregnancy is implantation of fertilized ovum to an abnormal site other than the uterus. Ectopic pregnancy is a threat to woman's life and subsequent pregnancy. Laparotomy was the traditional surgical treatment option, though laparoscopy is gaining significant popularity currently. The aim of this study is to compare the operative findings, operative procedure and, postoperative complications and hospital stay in patients with ectopic pregnancy managed by laparoscopy and conventional laparotomy.

Materials and methods: This observational study was conducted in Chittagong Medical College Hospital (CMCH) between April and September 2016. Sixty patients were selected from the women admitted with ectopic pregnancy fulfilling the inclusion-exclusion criteria and managed surgically. Thirty of these cases were managed by laparoscopy and other thirty were managed by laparotomy. Inclusion criteria included patients with diagnosed cases of ectopic pregnancy-who are candidate of surgery. Exclusion criteria were hemodynamically unstable patients, serious co-morbid conditions, known HbsAg +ve patients and patients unwilling to be included.

Results: Patients in both the groups are comparable in terms of age, parity, serum b-hCG level, gestational age, BMI and Hemoglobin level. Group A has statistically significant higher level of blood loss than group B. The number of patients requiring blood transfusion is also higher in group A. In both the groups salpingectomy was the highest performed operation. There was a statistically significant difference in hospital stay in group A and group B. Pain was the most frequent complain in both the groups.

Conclusion: Laparoscopy is a feasible and safe alternative to laparotomy in the surgical management of ectopic pregnancy. It also has a great role in diagnosis of clinically suspicious cases. Therefore, laparoscopy should be an option whenever possible with arrangements of better equipment and training of the surgeons.

Key words

Ectopic pregnancy; Laparotomy; Laparoscopy.

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Introduction

Ectopic pregnancy is implantation of fertilized ovum to any site other than the normal site of uterus. An ectopic pregnancy is associated with certain demise of gestation, a threat to woman's life and a subsequent successful pregnancy. With high resolution trans-vaginal sonography, serum b-HCG assay and increased vigilance of the clinician, more and more cases are being diagnosed before rupture.¹ Several developments in the management of ectopic pregnancies have led to remarkable success in saving mother's life.¹ Surgical management remains the first line of treatment in ruptured ectopic pregnancy. In 1759, the first successful surgical intervention was reported. For more than next 200 years, surgical treatment was primarily by laparotomy.¹

Laparotomy is an open surgery during which an abdominal incision is made. Laparotomy to treat ectopic pregnancy is often performed in emergency situations, when a woman has excessive internal bleeding from the site of ectopic pregnancy.

Laparoscopic surgery for ectopic pregnancy was first reported by Bruhart et al in 1980.² Traditionally, surgical treatment of ectopic pregnancy was done by laparotomy,

currently laparoscopy is gaining significant popularity in diagnosis and management of ectopic pregnancy.² The role of laparoscopy in the surgical management of ectopic pregnancy is well recognized and it has added new approaches to the diagnostic and treatment modalities. Choice for these techniques depends on many factors like the availability of equipment, skill of surgeon, condition of patients etc. Laparoscopy has advantage of shorter operative time, speedy postoperative recovery and low costs. Follow-up studies have demonstrated less adhesions while compared to laparotomy.³

The introduction of laparoscopy in management of gynecological pathology in Bangladesh is new and imminent. Gynecological laparoscopic service has started only in the last decade. Though laparoscopy is the advocated route of surgery whenever possible, laparoscopic approach in ectopic pregnancy is a new experience both to the patient as well as to the operating surgeon. Therefore, the outcome of laparoscopic surgery could be different from that in centers where laparoscopy has already been an established procedure.

Management option of the ectopic pregnancy presented late and in ruptured cases is surgical. Laparotomy was conventionally practiced from very early days, but now a days it is being replaced by laparoscopic procedures. But for laparoscopy trained hand and instrument is must which is still not easily available in our context. But there is scarcity of data regarding complications and outcome of laparoscopic procedures in relation with laparotomy in our context. So, it is a good opportunity to do a study in this context.

The normal place for a pregnancy to grow is inside the uterus. An ectopic pregnancy is one that develops outside of the uterus. The most common place for an ectopic pregnancy is in a fallopian tube. Other sites are Ovarian, Abdominal, Cervical, Angular, Cornualetc.² The most common risk factors for an ectopic pregnancy are damaged fallopian tubes or tubal problems. Some causes of tubal problem are pelvic infection, sexually transmitted infections, endometriosis, previous tubal surgery, previous ectopic pregnancy. Upto 50% of women will have no risk factors and the cause of the ectopic pregnancy is not known. Signs of ectopic pregnancy include missed period, pain in pelvic or abdominal area that may be on one side, vaginal bleeding or spotting and pain in the tip of shoulder.

Surgery is preferable if the hCG level is >1500 IU/L or if there is a visible ectopic pregnancy sac with fetal cardiac activity or if there is a mass of greater than 35 mm. In appropriate cases surgery provides rapid confirmation of the diagnosis with shorter resolution time of the ectopic pregnancy thus avoiding prolonged monitoring. Surgery also allows an accurate assessment of the pelvis which is helpful for counseling. It is preferable to demonstrate an ectopic pregnancy sac or adnexal mass on TVS prior to surgery.²

A laparoscopic approach to the surgical management of ectopic pregnancy is preferred. A woman with hemodynamic instability due to intraperitoneal hemorrhage should be treated by the most expedient surgical method to gain rapid hemostasis. Without evidence for an open or laparoscopic approach for a woman in shock, laparotomy has traditionally been favored.³ More, recent evidence suggests that laparoscopic treatment is safe and effective for suitably trained and experienced staff.

Rashmi A Gaddagi, et al. conducted a Clinical study of ectopic pregnancy in 2006 in 37 patients, incidence was 1:399 pregnancies. Pain abdomen, amenorrhea, per vaginal bleeding was common symptoms. Ultrasound, urine pregnancy test, culdocentesis were investigative modalities used, and cases were managed surgically. Most common site was ampulla. Tube was ruptured in 80% of cases.⁴

De Bennetot M et al. in 2008 studied risk factors for recurrence of ectopic pregnancy in 1108 patients, the rate of recurrence was significantly higher among women who had a history of voluntary termination of pregnancy. Fewer recurrences occurred among women having history of infertility or previous live birth.⁵

Richardson A studied medical management of ectopic pregnancy, 398 women were identified in total. Study concluded that although follow up duration and the need for repeat dose of methotrexate and/or surgical intervention increases with increasing serum beta HCG, medical management is still safe and effective when the beta HCG is >3000IU/L.⁶

Kouame N et al. studied ultrasound diagnosis and epidemiological features of ectopic pregnancy, concluded that ectopic pregnancy involves commonly young nulliparous women with a prior history of abortion and adnexal infection. Ultrasound aided early diagnosis and consequently tube preservation in 34.4% of the cases.⁷

Duggal BS et al. conducted a study on laparoscopic management of ectopic pregnancies. Out of 52 patients, 30 were treated laparoscopically and 22 patients underwent laparotomy. In 30 cases managed laparoscopically, salpingostomies were done in 16. In laparoscopic group, the postoperative morbidity and post hospital stay were significantly less. Laparoscopic surgery has more advantages than open surgery and it is a safe and feasible approach.⁸

The aim of this study is to compare the operative findings, operative procedure and, postoperative complications and hospital stay in patients with ectopic pregnancy managed by laparoscopy and conventional laparotomy.

Materials and methods

This observational study was conducted in the Departments of Obstetrics and Gynaecology, Chittagong Medical College Hospital (CMCH), Chattogram from April 2016 to September 2016.

Sixty patients were selected by purposive sampling from the women admitted in the Department of Gynecology and Obstetrics, Chittagong Medical College Hospital (CMCH) with ectopic pregnancy fulfilling the inclusion-exclusion criteria and managed surgically. Thirty of these cases of ectopic pregnancy were managed by laparoscopy and other 30 cases were managed by laparotomy. Inclusion criteria included patients with diagnosed cases of ectopic pregnancy-who are candidate of surgery. Exclusion criteria were hemodynamically unstable patients, serious co-morbid conditions, known HbsAg +ve patients and patients unwilling to be included. Ethical approval was obtained from ERB of Chittagong Medical College before started the study.

The patients admitted in the Department of Gynecology and Obstetrics were initially considered as study patients. From all eligible subjects after getting consent, clinical history was taken and clinical examinations were done. Important investigations including Hb%, transvaginal ultrasonography findings were also noted. Patients were divided into two groups. Group A laparotomy & Group B laparoscopy. Sampling was purposive. Treatment option and mode of surgery were also recorded. Per-operative findings and postoperative follow up notes were recorded. All relevant data was noted in the pre tested data sheet.

Patient's data was recorded on pre designed Case Record Form (CRF). All the parameters were analyzed with appropriate statistical test. p value was considered significant when it was <0.05. Statistical analysis was performed with the SPSS software package (SPSS for Windows version 20, SPSS Corporation) and data were presented in tabulated forms and graphs.

Participation of the patients was voluntary. Consent was obtained after a brief explanation about the study. It was made clear to them that they are free to take part or refuse any part of the study. All answer was kept confidential. Interview was taken in a suitable time and place that was convenient to the responder. Every attempt was taken to conduct the interview privately.

Results

Table I Demographic and clinical data of the study group

Parameter	Group A	Group B	p value
Age (Mean $\pm$ SD) Years	28.5 $\pm$ 4.8	29.9 $\pm$ 4.7	0.98
Parity (Mean)	2.67 $\pm$ 1.1	2.7 $\pm$ 1.4	0.36
Beta -hCG	4387 $\pm$ 2387	4598 $\pm$ 5632	0.54
Gestational age (week)	8.54 $\pm$ 1.6	7.9 $\pm$ 1.5	0.34
BMI	24.65 $\pm$ 3.2	23.58	0.078
Hb level (gm/dl)	9.67 $\pm$ 3.6	9.85 $\pm$ 2.9	0.11

Table I showing different demographic parameters. Patients in both the groups are comparable in terms of age, parity, Beta-hCG level, gestational age, BMI and Hemoglobin level. There is no significant difference between two groups. Table II shows the amount of blood loss and transfusion between two groups.

Group A has statistically significant higher level of blood loss than group B. The number of patients requiring blood transfusion is also higher in group A.

Table II Blood loss and transfusion

Parameters	Group A (Laparotomy)	Group B (Laparoscopy)	p value
Estimated blood loss (ml)	555.7 $\pm$ 35.6	189.78 $\pm$ 12.8	0.001
Blood transfusions	15	5	0.001

In both the groups salpingectomy was the highest performed operation and in group A, two patients noticeably had received salphingoophorectomy. The table III portrays that hospital stay was 5.32 $\pm$ 2.6 days in group A and 1.20 $\pm$ 1.6 days in group B. The difference was statistically significant (p<0.012).

Table III Hospital stay

Parameters	Group A (Laparotomy)	Group B (Laparoscopy)	p value
Hospital Stay	5.32 $\pm$ 2.6	1.2 $\pm$ 1.6	<0.012

Table IV shows the early postoperative complains and complications in both the groups. Pain was the most frequent complain in both the groups. Internal hemorrhage was found in one patient of the laparotomy group.

Table IV Early post-operative complaints and complication (Within 48 hours)

Complaints	Group A	Group B	Total
Internal hemorrhage	1(3.3%)	0(0%)	1(1.7%)
Pain	27(90.0%)	20(66%)	47(78.0%)
Peritonitis	3(9.9%)	0(0%)	3(5%)
Intestinal obstruction	0(0%)	0(0%)	0(0%)
Total	30(100.0%)	30(100.0%)	60(100.0%)

Table IV showing early postoperative complications, which include hemorrhage, peritonitis and intestinal obstruction.

Discussion

Ectopic pregnancy remains a common gynecological condition that causes significant maternal morbidity and mortality. The incidence of ectopic pregnancy has increased from 0.5% 30 years ago to a current incidence of 1% to 2%.⁹ The technical advancement in the field of minimal access surgery has greatly enhanced the possibility of the diagnosis and treating the ectopic pregnancy effectively.⁹

In the present study regarding different demographic parameters where mean age group were 28.5 $\pm$ 4.8 years in group A and 29.9 $\pm$ 4.7 years in group B, parity was 2.67 $\pm$ 1.1 in group A and 2.7 $\pm$ 1.4 in group B, Hb level 9.67 $\pm$ 3.6 gm/dl in Group A and 9.85 $\pm$ 2.9 gm/dl in Group B. Findings are near similar with a previous study done by Jahan et al.⁹

In this study most of the women had amenorrhea, per vaginal bleeding and pain abdomen which were the dominant symptoms in both groups. A study done by Jahan et al. found abdominal pain in 96%, short period of amenorrhea in 89.1% and vaginal bleeding in 79%.⁹

The classical surgical approach for an ectopic pregnancy is by open laparotomy. Lawson Tait first described the lifesaving procedure of salpingectomy by laparotomy in 1884.¹⁰ It was not until some 70 years later that less radical operations with conservation of the involved tube during laparotomy were performed.¹¹ Laparoscopy has been used in the diagnosis of ectopic pregnancy for many years. Since the first excision of a tubal pregnancy through a laparoscope by Manhes and Bruhat in 1980, laparoscopy has been used with increasing frequency in the surgical treatment of ectopic pregnancies.¹²

As there was a trend towards more conservative surgery with laparoscopic approach, these results need to be interpreted with caution. Laparoscopic approach was associated with shorter hospital stay and quicker postoperative recovery time. Yao and Tulandi have shown that the subsequent intrauterine pregnancy rate was 70% after laparoscopic surgery compared to 55% after laparotomy.¹³ The recurrent ectopic rate was also lower after laparoscopy (5%) than after laparotomy (16.6%).¹⁴ In the present study we have demonstrated that ectopic pregnancy can be managed successfully via minimal access surgery and laparoscopic management offer several advantages over conventional treatment via laparotomy.

Limitations

Small sample size was also a limitation of the present study. The present study was conducted at a very short period of time with purposive sampling and the sample came from a single center in one geographic location. The study population was selected from one selected hospital in Chattogram, so that the result of the study may not reflect the exact picture of the country. Multiple centers should be included to make generalized result.

Conclusion

Laparoscopy is a feasible and safe alternative to laparotomy in the surgical management of ectopic pregnancy. Additionally, laparoscopy has a great role in diagnosis of clinically suspicious cases.

Recommendation

laparoscopy should be an option whenever possible. However, further studies with larger number of patients with nationally representative sample is needed to draw a conclusion. More surgeons should be trained in operative laparoscopic techniques. They should also be supported with sufficient modern equipment to facilitate safe surgery.

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Disclosure

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Sociodemographic Profile of Severe Acute Malnutrition among Under-Five Children in Cox's Bazar Medical College Hospital

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Abstract

Background: Childhood malnutrition is a leading public health issue in Bangladesh. Addressing the determinants of Severe Acute Malnutrition (SAM) among children remains a challenge in Bangladesh. This study evaluate the sociodemographic, environmental, and behavioural factors of children with SAM of Cox's Bazar, Bangladesh.

Materials and methods: This descriptive cross-sectional study included 82 consecutively admitted children with SAM under five years old in the Pediatric ward of Cox's Bazar Medical College from April to June 2021. SAM was defined based on based on Mid-Upper Arm Circumference (MUAC). Data were collected using a structured case record form by face-to-face interview of the mother.

Results: Most of the children (73.2%) were in the age group of 6-12 months, followed by 13-24 months (15%) and ³25 months (8.5%) with slight female preponderance (53.7%) 93.9% came from rural area, 59.8% of the mothers age during the childbirth was 15-24 years and 68% of the mother were either illiterate or have education up to primary level. 85.2% and 12.2% of the family were respectively, from poor and middle class. Only, 11% lived in the pucca house, 20.7% had no sanitary toilet facility, and waste disposal was unsanitary in 73.2% of the children. Breastfeeding was initiated within one hour in 45.1% of the children, 61% had colostrum and 36.6% of the children were exclusively breast fed. Though vaccination was favorable among the children none of the mothers were aware of SAM in the study.

Conclusion: In order to reduce the children's SAM, it is necessary to scale up services to improve the socioeconomic status which includes the education, occupation, and monthly income of the mother. Similarly, implementation of appropriate infant and young child feeding practice should be a policy priority.

Key words

Cox's Bazar; Malnutrition; Under-5 children.

Introduction

Severe Malnutrition (SAM) is defined as a weight-for-height measurement of 70% or less below the median, or three SD or more below the mean National Centre for Health Statistics reference values, the presence of bilateral pitting oedema of nutritional origin, or a mid-upper-arm circumference of less than 110 mm in children age 1–5 years.¹ The World Health Organization (WHO) recommends the use of MUAC and examination for bilateral

pitting edema in children 6–59 months of age by trained community health workers and community members for early identification and referral of children with SAM.² Among the other South Asian countries, though Bangladesh made a significant achievement in declining the prevalence rate of stunting children from 1997 (60%) to 2018 (31%) it is still inadequate to attain the target of ending all forms of undernutrition by 2030 (Sustainable Development Goal-2, Target 2.2).^{3,4} There are considerable geographic disparities in terms of stunting in Bangladesh, with a higher prevalence among rural than urban children.³ Globally, many studies conducted to identify factors affecting SAM among under-five children.⁴⁻⁷ In 2017, a study in Bangladesh found that low socioeconomic status, mother's age at birth >35, birth interval months <24 months, illiterate father, bottle feeding and not initiating complementary feeding at the age of 6 months were significantly associated with SAM.⁸ Despite the increasing prevalence of SAM among children in Bangladesh, limited studies have been undertaken to understand the determinants of SAM. Moreover, data mainly in the context of the mother-child pair is scarce on the determinants of SAM in children. The current study, therefore, investigated the maternal profiles and social determinants of SAM in a district of Bangladesh. The findings of the study give us the understanding to focus on the areas to sustain the reduction of SAM and improve the ongoing intervention programs in Bangladesh.

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Materials and methods

This descriptive cross-sectional study was conducted in Department of Pediatrics of Cox's Bazar Medical College Hospital, Cox's Bazar, Bangladesh from April to June 2021. The Ethical Clearance was obtained from Cox's Bazar Medical College Ethical Review Committee. Permission from Cox's Bazar Medical College Hospital was obtained, then verbal consent was obtained from the mothers or caregivers of the child under study, and confidentiality of the information given by the respondent was maintained.

Eighty-two children with SAM admitted to the pediatric ward were recruited consecutively. Children with a chronic illness like tuberculosis and other congenital abnormalities that can hamper the feeding pattern of the child were excluded from the study. The mothers of children who did not consent to participate in the study were also excluded from the study. The children were screened for their nutritional status by using MUAC measurement. A non-stretch measuring tape was used to the nearest 1 mm to measure MUAC. Severely malnourished was defined as children with MUAC<115 mm or bilateral pitting edema. Data were entered into a Microsoft Excell worksheet and expressed as frequency and percentage. Results and observations were presented through descriptive statistics only.

Results

The sociodemographic characteristics of the children with SAM was describe in Table I. It shows that, most of the children (73.2%) were in the age group of 6-12 months, followed by 13-24 months (15%) and ³25 months (8.5%). There was slight female preponderance (53.7%) and most of the children (93.9%) came from rural area. More than half (59.8%) of the mothers age during the child birt was 15-24 years and 68% of the mother were either illiterate or have education up to primary level. Regarding occupation most of the mothers (91.4%) were housemaker and most of the fathers (79.3%) were engaged in business. Regarding socioeconomic status 85.2% and 12.2% were, respectively from poor ans middle class. Family size was ≥ 5 in 48.8% of the cases.

Table I Sociodemographic characteristics of the children with SAM (n=82)

Attributes □	n□	%
Children age □	□	
□ 6-12 months□	60□	73.2
□ 13-24 months□	15□	18.3
≥25 months □	7□	8.5
Sex of the children □	□	
□ Male □	38□	46.3
□ Female □	44□	53.7
Locality □	□	
□ Urban □	5□	6.1
□ Rural□	77□	93.9

Attributes □	n□	%
Mother's age at birth □	□	
□ 15-24 years□	49□	59.8
□ 25-34 years □	28□	34.1
□ >34 Years □	5□	6.1
Mother's education □	□	
□ No schooling □	17□	20.7
□ Primary □	38□	46.3
□ Secondary □	16□	19.5
□ Higher secondary and above □	11□	13.4
Mother's occupation□	□	
□ Housemaker □	75□	91.4
□ Employed outside □	7□	8.6
Fathers' occupation□	□	
□ Day labour □	6□	7.3
□ Government/NGO service □	5□	6.1
□ Business □	65□	79.3
□ Unemployed □	6□	7.3
Socio-economic status □	□	
□ Poor □	70□	85.4
□ Middle class □	10□	12.2
□ Rich □	2□	2.4
Family size □	□	
□ <5 members □	42□	51.2
≥5 members □	40□	48.8

Environmental conditions of the children with SAM has been described in Table II. It depicted that a poor housing and sanitary conditions in most of the children. Only, 11% lived in the pucca house, 20.7% had no sanitary toilet facility, and waste disposal was unsanitary in 73.2% of the children.

Table II Environmental factors of the children with SAM

Attributes □	n□	%
Type of house □	□	
□ Kaccha □	68□	82.9
□ Semi pucca□	5□	6.1
□ Pucca □	9□	11.0
Toilet facility □	□	
□ Sanitary □	65□	79.3
□ Non-sanitary□	17□	20.7
Drinking water□	□	
□ Treated □	81□	98.8
□ Untreated □	1□	1.2
Waste disposal □	□	
□ Sanitary □	22□	26.8
□ Unsanitary □	60□	73.2

Among less than half (45.1%) of the children the breastfeeding was initiated within one hour. Sixty-one percent of the respondents reported giving colostrum to their baby. Only 36.6% of the mothers said that they fed their baby breast milk exclusively during the first six months of life. Though vaccination was favorable among the children none of the mothers were aware of SAM in the study.

Table III Behavioural factors of the children with SAM

Attributes □	n□	%
Initiation of breast feeding □	□	
□ Within one hour of birth □	37□	45.1
□ After one hour from birth □	45□	54.9
Colostrum feeding □	□	
□ No □	32□	39.0
□ Yes □	50□	61.0
Frequency of breast feeding □	□	
□ <8 times per day □	34□	39.5
□ ≥8 times per day □	48□	58.5
Exclusive breast feeding for 6 months □	□	
□ No □	52□	63.4
□ Yes □	30□	36.6
Initiation of supplementary feeding □	□	
□ <6 months □	50□	61.0
□ 6-12 months □	31□	37.8
□ >12 months □	1□	1.2
Vaccination status of the children □	□	
□ Ongoing □	65□	79.3
□ Completed □	16□	19.5
□ Incomplete □	1□	1.2
Mothers' awareness about SAM□	□	
□ Yes □	0□	0
□ No □	82□	100.0

Discussion

Present study investigated the sociodemographic, environmental, and behavioural factors of children aged between 6 months and 59 months with SAM admitted in the hospital of Cox's Bazar. The results of this study showed unfavourable sociodemographic, environmental, and behavioural conditions among these children with SAM.

In the present study, about three quarter of the children were infant. The practice of an optimal number of feedings could be less for the younger children in the study, and that's why these group of children are more frequently observed in the study. Previous studies were consistently reported that, age had a significant effect on the nutritional status of the children. The higher odds of SAM was found in 6–24 months age group compared to the 25–59 months age group children in previous studies from Bangladesh, Nepal, Ethiopia and South India.^{5,8-10} SAM is more prevalent among girls than boys in the current study. This could be assigned to the fact that girls are at more risk of health disparities compared to boys in the same age group, and more care and attention are provided to boys by their caregivers. Similar findings were found previously in Nepal and India.^{5,11} Educational level was not satisfactory in the present study and majority of the mothers were not engaged in any vocational

activities outside home. Many studies found that maternal education had a positive and statistically significant effect on the nutritional status of the children and unemployed mothers observed more malnourished children compared to employed mothers who get a monthly salary from their employment.^{5,8} Most of the families in the current study were from poor social class. It is observed that socio-economic status has a significant effect on the nutritional status of the children. Mothers with higher education might have a better understanding of balanced dietary intake for the family members, thus enhances the nutritional status of their children.¹²

Good environmental and sanitation is essential prerequisite for optimal growth and sound health.¹³ Absences of these are commonly associated with malnutrition, which was confirmed in the present study.

Good feeding practice among under-five children helps to prevent acute malnutrition and growth retardation.¹⁴ In the present series of children with SAM, in less than half (45.1%) of the children the breastfeeding was initiated within one hour. Sixty-one percent of the respondents reported giving colostrum to their baby. Only 36.6% of the mothers said that they fed their baby breast milk exclusively during the first six months of life.

Limitations

Since this study was based on cross-sectional data and as a result, exploring the association between selected factors and the prevalence of malnutrition cannot establish a causal association between the two. Moreover, birth weight and birth spacing could be essential factors for SAM, but these variables were not included in the study. Recruiting cases at the hospital may have introduced a self-selection bias, as cases were selected based on MUAC only.

Conclusion

Based on the findings of this study, it was revealed that SAM was more frequent among female of younger age group, having poor environmental and sanitation, and poor infant and young child feeding practice. This study confirms that there are quiet rooms to perk up the child's nutritional status in Bangladesh.

Recommendations

More research should be conducted using quantitative and qualitative approaches to depict the comprehensive scenario of SAM among the under-5 children of Bangladesh and address multi-sectoral intervening programs for eradicating SAM.

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Disclosure

All the authors declare no conflicts of interest.

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Present Assessment Status of 'Allied Subjects of Surgery' in Undergraduate Medical Education of Selected Medical Colleges of Bangladesh: Intern Doctors' Views

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Abstract

Background: The assessment is an integral part of clinical teaching-learning process in undergraduate medical education. It was aimed to identify the views of intern doctors about the present assessment status of 'Allied Subjects of Surgery'.

Materials and methods: This cross sectional study was conducted from January 2021 to December 2021. A total 151 intern doctors were selected as they already completed their MBBS course and practically implementing their knowledge. Self-administered semi-structured questionnaires were provided to collect data from selected intern doctors. Convenience sampling technique was adopted for selection of eight medical colleges of Bangladesh. Among the medical colleges four medical colleges were inside Dhaka (Two were govt. and two were non-govt.) and another four were outside Dhaka (two were govt. and two were non-govt.) and the respondents were selected purposively.

Results: This Study revealed that the conditions of different issues of summative assessments (Professional examinations) likewritten segment (Short answer questions, multiple choice questions) oral segment (Structured oral examinations) and practical segment (Objective Structured Clinical Examinations (OSCE) short cases and long cases) were poor in most of the Allied Subjects of Surgery compared to General Surgery, Otolaryngology and Ophthalmology and these differences were also statistically highly significant ($p < .05\%$) in all cases.

Conclusion: Hence it can be recommended that most of the Allied Subjects of Surgery should get optimum importance during the assessment procedures in undergraduate medical education of Bangladesh according to the health needs of the community.

Key words

Allied subjects of surgery; Evaluation of surgery; Undergraduate medical education.

Introduction

Common problems found with clinical teaching are as follows: lack of clear objectives and expectation; focus on factual recall rather than on development of problem solving skills and attitudes; teaching pitched at the

incorrect level, usually too high; passive observation instead of active participation of learners, inadequate supervision and provision of feedback; little opportunity for reflection and discussion; informed consent not sought from patients; lack of respect or privacy and dignity of patients and lack of continuity with the rest of the curriculum.¹ The purpose of assessment is to meet the public anticipation about the quality graduates, to give feedback to the educational directors about the class, to separate the scholars according to their gift and to cover their own literacy. Assessment also provides a high degree of fairness and neutrality in testing and produces data to enable nonstop quality enhancement.²

The welfare and indeed the future health of people depend on the quality of medical graduates and the quality of medical education depends on quality of medical education. Educationists believe that just by changing the assessment style for the learners can affect the way students engage with the topic contents.³ The process of medical education in Bangladesh began with the establishment of the Mitford school of medicine and Hospital at Dhaka within the early 20th century. The medical education system inherited the standard features of colonial education, which is extremely much on the normal pattern: lecture-based, teacher-centered, discipline-based, examination-driven and hospital-oriented. Till 1988, there was no formal medical curriculum except a syllabus, published by Bangladesh Medical and Dental Council.⁴

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In another study in India, they feel that their students were assessing subjects from an examination point of view, rather than importance in clinical practice. One student wrote that 'the teaching is sufficient for the 60 marks of theory and one short case which is the required in the Orthopedics MBBS examination'. Another student mentioned 'Orthopedics is low priority than to the upper marks awarded to other final MBBS Subjects'. Orthopedics therefore must be accorded the status of a separate subject within the medical curriculum with independent evaluation almost like ENT or Ophthalmology. Merely expanding the curriculum isn't sufficient; the examination process must be more relevant.⁵ According to MBBS curriculum, 2012 Allied Subjects of Surgery are Orthopedics, Radiology, Radiotherapy, Transfusion medicine, Anesthesia, Neurosurgery, Pediatric Surgery, Urology, Burn Plastic Surgery, Emergency & casualty, Ophthalmology, and Otolaryngology. It is believed that due to more time and effort given for General Surgery, Ophthalmology & Otolaryngology both in teaching and assessment and lack of different facilities, the teaching and learning of Allied Subjects of Surgery are relatively neglected at undergraduate level which is reducing the competency of MBBS doctors in Bangladesh to manage the basic surgical problems in practical field. So, it was aimed to identify the views of intern doctors about the present assessment status of 'Allied Subjects of Surgery' in undergraduate medical education in some selected medical colleges of Bangladesh.

Materials and methods

This cross-sectional descriptive study was conducted from 01 January 2021 to 31 December 2021 (01 year) after approval from Institutional Review Board (IRB) of Centre for Medical Education of Bangladesh (CME) as a part of thesis of Masters in Medical Education (MMEd) under Bangabandhu Sheikh Mujib Medical University (BSMMU). Data were collected from purposively selected 151 intern doctors from conveniently selected eight medical colleges of Bangladesh after getting permission from the concerned authorities and respondents. Inclusion criteria was respondents who were present at the time of datacollection and who voluntarily participated in the study after initialcommunication and exclusion criteria was respondents who were unwilling to participate and who were not present at the time of datacollection. Their comments regarding assessment were collected in a self-administered semi structured questionnaire that contained fifteen questions on this issue in Surgery and its Allied Subjects in undergraduate medical education of Bangladesh. The questionnaires were distributed to the intern doctors and were collected with the responses face to face; in some cases these were collected by online (WhatsApp) procedure due to restrictions in COVID-19 pandemic situation. Data were entered, processed and analyzed by using SPSS software program version 26.

Results

In this study, out of total 151 respondent intern doctors, 83(55%) were female and 68(45%) were male. The participants from government medical colleges were predominant than that of non-government medical colleges (64% vs 36%).

The mean scores of intern doctor's satisfaction level regarding marks allocation in the written segment of final professional examination were higher in case Surgery than all Allied Subjects except Ophthalmology and Otolaryngology. These differences were statistically highly significant in case of all Allied Subjects except Ophthalmology (Table I).

Table I Level of satisfaction of intern doctors about marks allocated in the written segment final professional examination of Surgery and its Allied Subjects in MBBS course (n=151)

Level of satisfaction with corresponding grade						
	Number (%)					
Subjects	HIAd=1	IAd=2	Ad=3	Had=4	Mean(+SD)	p value
Surgery	1(.3)	-	33(11.8)	117(40.5)	3.76(.474)	Act as control
Orthopedics	1(.3)	28(9.7)	99(34.3)	23(8.0)	2.98(.685)	.000**
Radiology	14(4.8)	96(33.2)	39(13.5)	2(.7)	2.19(.608)	.000*
Radiotherapy	38(13.1)	112(38.8)	1(.3)	-	1.75(.447)	.000*
Transfusion medicine	35(12.1)	111(38.4)	5(1.7)	-	1.80(.476)	.000*
Anesthesia	2(.7)	48(16.6)	100(34.6)	1(.3)	2.66(.515)	.000*
Neurosurgery	-	46(15.9)	103(35.6)	1(.3)	2.72(.508)	.000*
Pediatric Surgery	2(.7)	30(10.4)	112(38.8)	7(2.4)	2.82(.518)	.000*
Urology	1(.3)	10(3.5)	135(46.7)	5(1.7)	2.95(.353)	.000*
Burn Plastic Surgery	28(9.7)	46(15.9)	76(26.3)	1(.3)	2.33(.781)	.000*
Emergency & casualty	30(10.4)	53(18.3)	64(22.1)	4(1.4)	2.28(.810)	.000*
Ophthalmology	2(.7)	-	17(5.9)	132(45.7)	3.85(.458)	.090*
Otolaryngology	-	-	17(5.9)	134(46.4)	3.89(.317)	.005**

*Unpaired t test done due to homogenous variances

**Welch t test due to heterogeneous variances.

HIAdq = Highly Inadequate, IAdq = Inadequate, Adq = Adequate, HAdq = Highly Adequate.

The mean scores of intern doctor's satisfaction level regarding marks allocation in the oral segment of final professional examination were higher in case Surgery than all Allied Subjects except Ophthalmology and Otolaryngology. These differences were statistically highly significant in case of all Allied Subjects except Ophthalmology and Otolaryngology (Table II).

Table II Level of satisfaction of intern doctors about marks allocated in the oral segment of final professional examination of Surgery and its Allied Subjects in MBBS course (n=151)

Level of satisfaction with corresponding grade						
Number (%)						
Subjects	HIAd=1	IAd=2	Ad=3	Had=4	Mean(+SD)	p value
Surgery	-	-	30(10.7)	121(41.9)	3.80(.404)	Act as control
Orthopedics	-	11(3.8)	11(3.8)	11(3.8)	3.13(.674)	.000**
Radiology	20(6.9)	62(21.5)	68(23.5)	1(.3)	2.33(.709)	.000**
Radiotherapy	45(15.6)	104(36.0)	2(.7)	-	1.72(.481)	.000**
Transfusion medicine	43(14.9)	97(33.6)	8(2.8)	-	1.81(.652)	.000**
Anesthesia	-	42(14.5)	106(36.7)	-	2.75(.521)	.000**
Neurosurgery	1(.3)	66(22.8)	83(28.7)	-	2.56(.549)	.000**
Pediatric Surgery	-	37(12.8)	108(37.4)	6(2.1)	2.79(.494)	.000**
Urology	1(.3)	24(8.3)	126(43.6)	-	2.83(.396)	.000*
Burn Plastic Surgery	29(10.0)	65(22.5)	57(19.7)	-	2.19(.734)	.000**
Emergency & casualty	30(10.4)	72(24.9)	44(15.2)	5(1.7)	2.16(.775)	.000**
Ophthalmology	1(.3)	-	20(6.9)	130(45.0)	3.85(.412)	.272*
Otolaryngology	-	-	19(6.6)	132(45.7)	3.87(.333)	.067**

*Unpaired t test done due to homogenous variances

**Welch t test due to heterogeneous variances

HIAdq = Highly Inadequate, IAdq = Inadequate, Adq = Adequate, HAdq = Highly Adequate.

The mean scores of intern doctor's satisfaction level regarding marks allocation in the practical segment of final professional examination were higher in case Surgery than all Allied Subjects. These differences were statistically highly significant in case of all Allied Subjects except Ophthalmology and Otolaryngology (Table III).

Table III Level of satisfaction of intern doctors about marks allocated in the practical segment of final professional examination of Surgery and its Allied Subjects in MBBS course (n=151)

Level of satisfaction with corresponding grade						
Number (%)						
Subjects	HIAd=1	IAd=2	Ad=3	Had=4	Mean(+SD)	p value
Surgery	-	-	27(9.3)	124(42.9)	3.84(.422)	Act as control
Orthopedics	1(.3)	30(10.4)	109(37.7)	8(2.8)	2.87(.564)	.000**
Radiology	23(8.0)	73(25.3)	55(19.0)	-	2.21(.689)	.000**
Radiotherapy	55(19.0)	96(33.2)	-	-	1.64(.483)	.000**
Transfusion medicine	51(17.6)	91(31.5)	9(3.1)	-	1.72(.568)	.000**
Anesthesia	6(2.1)	83(28.7)	62(21.5)	-	2.37(.561)	.000**
Neurosurgery	-	91(31.5)	59(20.4)	-	2.41(.533)	.000**
Pediatric Surgery	1(.3)	22(7.6)	121(41.9)	7(2.4)	2.89(.455)	.000*
Urology	2(.7)	38(13.1)	111(38.4)	-	2.72(.478)	.000**
Burn Plastic Surgery	33(11.4)	100(34.6)	18(6.2)	-	1.90(.575)	.000**
Emergency & casualty	29(10.0)	100(34.6)	8(2.8)	14(4.8)	2.05(.786)	.000**
Ophthalmology	1(.3)	-	26(9.0)	124(42.9)	3.81(.443)	.579*
Otolaryngology	1(.3)	-	21(7.3)	129(44.6)	3.84(.418)	.909*

*Unpaired t test done due to homogenous variances, **

Welch t test done due to heterogeneous variances, HIAdq = Highly Inadequate, IAdq = Inadequate, Adq = Adequate, HAdq = Highly Adequate.

Discussion

In case of marks allocated in the written segment (Table I) and the practical segment (Table III) of final professional examination, the mean scores were higher in case Surgery than all Allied Subjects except Ophthalmology and Otolaryngology and the differences were statistically highly significant in case of all Allied Subjects except Ophthalmology in the written segment and except Ophthalmology and Otolaryngology in the practical segment.

In case of marks allocation in the oral segment of final professional examination (Table II) it was found that the mean scores were higher in case Surgery than all Allied Subjects except Ophthalmology and Otolaryngology and the differences were statistically highly significant in case of all Allied Subjects except Ophthalmology and Otolaryngology though with Otolaryngology the similarity with Surgery was more. In another study in India it was recommended that Pediatric Surgery should be included as a separate subject in the medical curriculum with independent evaluation similar to Pediatric Medicine, Orthopedics, ENT etc. The examination process must be more relevant, practical oriented and these changes will eventually translate in to raise patient care.⁶ In a survey of family physicians, it was found that half of them thought that their training in orthopedics in undergraduate level was inadequate.⁷

So from the above discussion according to the opinion of the intern doctors General Surgery, Ophthalmology and Otolaryngology getting more priority in different assessment procedures in final professional examination of Surgery in MBBS course. There is an unavoidable truth that assessment drives learning.⁸ In a study it's been noted that urological diseases are of great interest for the first care physicians and thus efforts should be aimed toward optimizing the teaching of the most theoretical content and practical skills in Urology within the Degree in Medicine, ensuring proper care of patients by these GPs in the future.⁹

Conclusion

The newer Allied Subjects of Surgery that were included in the MBBS curriculums in 2002 and 2012 are neglected in present assessment procedures compared to Surgery, Ophthalmology and Otolaryngology in MBBS course of Bangladesh. Now we should give adequate emphasis during assessments on these Allied Subjects according to the curricular contents which were definitely formulated considering the community.

Limitations

Getting access to the study areas and specially obtaining the views of the intern doctors of the selected medical colleges were a great challenge during COVID 19 pandemic situation. Hence some data were collected online format. The selection of the medical colleges and the data collection procedure was convenience, so it was difficult to generalize the result. Data was based on self-reporting which was a source of bias in the responses.

Disclosure

All the authors declared no competing interest.

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Comparative Evaluation of HALL Technique and Conventional Restorative Technique for Managing Carious Primary Molars

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Abstract

Background: Hall Technique (HT) is a biological approach where decay is sealed under preformed metal crowns without any caries removal, tooth preparation, or local anesthesia. Dental caries is one of the most common problems that affect both adults and children. To address a better option for the dental care needs in pediatric patients dental surgeons require some alternatives for the management of caries in children rather than the traditional drill and fill approach or conventional restorative treatment. The Hall technique is one such minimally invasive treatment approach developed by Dr. Norna Hall in the 1980s. The purpose of this study was to evaluate and compare the HALL Technique and the conventional restorative technique for managing carious primary molar. To evaluate and compare the effectiveness of the Hall Technique and Conventional restorative techniques for managing carious primary molar.

Materials and methods: A prospective randomized control trial was conducted on patients attending the Department of Pediatric Dentistry at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka. Patient's age 4-7 years. A total of 64 teeth, that fulfilled the inclusion criteria were selected for the study after clinical and radiographic evaluation. According to inclusion and exclusion criteria, 64 primary molars were selected. Out of these 64 Primary molars 32 teeth were treated with Hall Technique and the remaining 32 teeth were treated with the conventional restorative technique. Clinical follow-up examination was done at 3 months, 6 months, 9 months, and 12 months intervals to evaluate and compare the discomfort, retention of restoration, and pain.

Results: After 1 year follow up Hall Technique out performed conventional restorative technique. Hall Technique success rate was 93.8% clinically while in conventional restorative technique was 62.5%. Most of the failure in Conventional Restorative Technique was due to dislodgement of restoration. p-value ($p=0.005$) showed statistically significant difference between Hall technique and conventional restorative technique.

Conclusion: Hall Technique treated molars demonstrated better performance. HALL Technique seems to be a suitable replacement instead of the conventional restorative technique for the management of carious primary molars.

Key words

Conventional restorative technique; Dental caries; Hall technique; Local anesthesia.

Introduction

Dental caries is the most prevalent disease throughout the world and is considered the most important burden on oral

health. Teeth undergo a constant process of demineralization (Caused by the acids and enzymes produced by cariogenic bacteria in the dental biofilm) and remineralization (From protective factors such as fluoride and salivary components).¹ Dental caries occurs when the rate of demineralization is greater than that of remineralization. When the dissolution of enamel and dentine lead to cavitation, the carious lesion can no longer be cleaned properly and it becomes more difficult to arrest the caries process as the biofilm becomes more sheltered, which favors the cariogenic bacteria. This is when the necessity of restoration is considered, to protect vulnerable tissue and to allow the tooth tissue to function again.²

Untreated dental caries have an adverse effect on children's ability to grow and thrive.³ Early exfoliation of primary teeth causes temporary or permanent occlusion disorder, aesthetic problem, nutritional disorder, development of abnormal oral habits, speech disorder as well as psychological problem in the future. Due to these reasons, restorative treatment of carious primary teeth has an important role in pediatric dentistry.⁴

Conventional treatment of caries includes surgical removal of the infected dental tissues, followed by restoration with a suitable filling material.⁴ This

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conventional dental treatment is invasive, often involving the destruction of considerable amounts of the sound tooth for access to the carious lesion.⁵ Failure of restorations in primary teeth is more common in younger age groups because of the anatomy of primary teeth, small mouths, and age-appropriate limited cooperation can make the placement of restorations challenging. This leads to an increase in the number of appointments and also the cost.⁶ Conventional Restoration of carious primary teeth needs the use of local anesthesia and the use of rotary instruments which is an expected source of discomfort for the child and makes him reluctant to seek treatment despite his pain.⁷ This approach also includes the removal of carious dentin which has an increased risk of pulp exposure, postoperative pulpal symptoms, and the weakening of the tooth.¹ Also, the high-pitched noise of the handpiece produces a synergistic effect on the anxiousness of the pediatric patient.⁶

One such alternative treatment is the Hall Technique (HT), developed by Norna Hall.⁴ However, the “Hall Technique” is a novel clinical approach to treating carious primary molar teeth. The Hall Technique works in two ways:

- i) The PMC is cemented in place without any tooth preparation or local anesthesia
- ii) Carious tooth tissue is not removed but sealed and cemented by the PMC thus isolating it from the rest of the mouth.

To compare and evaluate the better method between the HALL technique and the Conventional Restorative technique for managing carious primary molar teeth in terms of Discomfort, Pain and Retention of restoration.

Materials and methods

This was a Randomized control trial conducted from June 2021 to September 2022 at the Department of Pedodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University (BSMMU) Dhaka.

The study population was comprised of patients age 4 to 7 year having carious primary molar not involving pulp irrespective of gender. Simple random sampling technique was employed to select the cases.

In relation to this study calculative value is 29. To compensate the drop out, technical fault, inadequate data etc. calculative value will be increase upto 32.

Inclusion criteria

- Children 4-7 years of age
- Having primary molars with caries not extending beyond the dentin.
- Informed consent from parents

Exclusion criteria

- Irreversible pulpal involvement or dental abscess.
- Insufficient sound tooth structure to retain the crown
- Non restorable, malposed, malformed teeth
- Children having bruxism.

Evaluation of clinical finding was done at 3, 6, 9 and 12 month intervals. Data was collected for assessment of longevity of the restoration. Available data were cross checked by supervisor.

The analysis was accomplished using computer-based software SPSS version 22 (Statistical Package for Social Science). The finding of the study were presented by frequency and percentage in graph and tables. Association of categorical data were done using the chi-square test. A p-value of less than .05 considered as a statistically significant.

Results

Table I Distribution of study subjects (n=64) according to age

Age distribution	Group-A (HT)		Group-B (CRT)	
	Frequency	Percentage	Frequency	Percentage
4-5 years	13	40.6	23	71.9
6-7 years	19	49.4	9	28.1
Total	32	100.0	32	100.0

Group-A: HALL Technique (HT)

Group-B: Conventional Restorative Technique (CRT)

Group A Mean $\pm$ (SD) 5.62 $\pm$ 1.23

Group B Mean $\pm$ (SD) 4.96 $\pm$ 1.17

Table I shows that in group A - 49.4% (19) of samples were from age group 6-7 years and 40.6% (13) were from age group 4-5 years where the mean age is 5.62 $\pm$ 1.23. In group B - predominant 71.9% (23) of samples from age group 4-5 years and 28.1% (9) from 6-7 years where the mean age is 4.96 $\pm$ 1.17.



Figure 1 Distribution of study patients (n=64) by Sex (n=32 in each group)

Group-A: HALL Technique (HT)

Group-B: Conventional Restorative Technique (CRT).

Figure 1 shows that in group A, males are 47% (15) and females are 53% (17). In group B, males are 44% (14) and females are 56% (18). In both groups, females are predominant

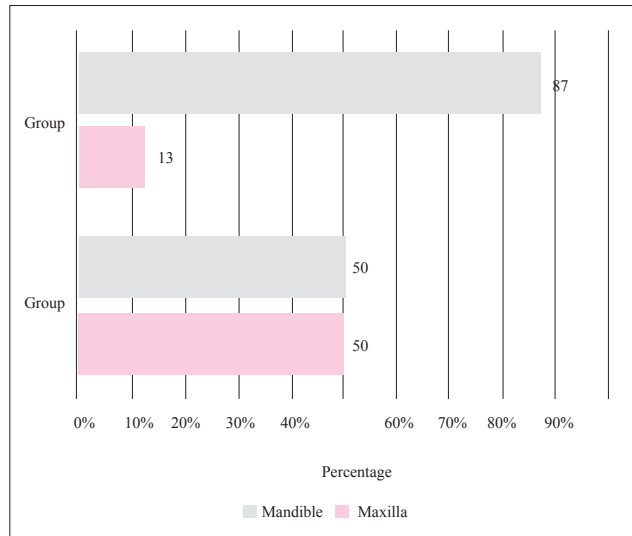


Figure 2 Distribution of study patients (n=64) by location of teeth

Group-A: HALL Technique (HT)

Group-B: Conventional Restorative Technique (CRT).

Figure 2 shows that in group A, 50% (16) teeth are maxillary and 50% (16) teeth are mandibular. In group B, the predominant teeth are mandibular, 87% (28) and only 13% (4) teeth are maxillary.

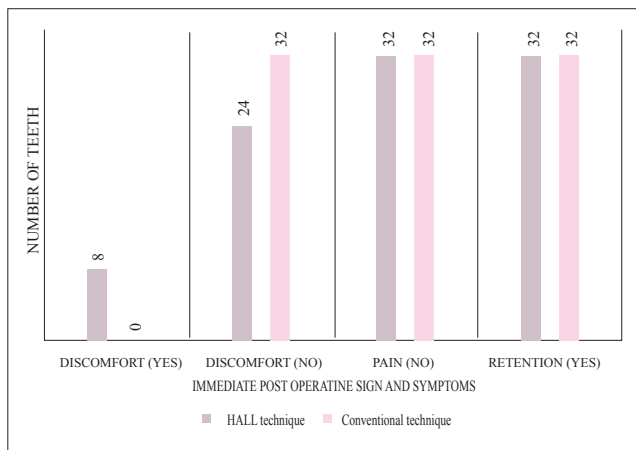


Figure 4 Immediate postoperative signs and symptoms in both groups (n=64)

Group A: HALL Technique (HT)

Group B: Conventional Restorative Technique (CRT).

Figure 4 shows that in Hall technique mild discomfort was reported in 8 teeth (Maxillary 1st primary molar-2, Maxillary 2nd primary molar-2, Mandibular 1st primary molar-3, Mandibular 2nd primary molar -1) due to increase occlusovertical dimension and which resolves after one week. The remaining teeth did not show any immediate post-operative sign and symptoms.

Table II Clinical performance of restorations in both groups (n=64)

Variables of clinical performance	Group A				Group B			
	After 3 months	After 6 months	After 9 months	After 12 months	After 3 months	After 6 months	After 9 months	After 12 months
Discomfort								
0=No discomfort	32 (100%)	30 (94%)	30 (94%)	30 (94%)	31 (97%)	26 (81%)	25 (78%)	25 (78%)
1=Mild discomfort	-	02 (6%)	-	-	01 (3%)	04 (12%)	-	-
2=Moderate discomfort	-	-	-	-	-	-	-	-
3=Severe discomfort	-	-	-	-	-	01 (3%)	01 (3%)	-
Pain								
0=No pain	32 (100%)	31 (97%)	31 (97%)	31 (97%)	32 (100%)	30 (94%)	30 (94%)	29 (91%)
1=Mild pain	-	01 (3%)	-	-	-	01 (3%)	-	-
2=Moderate pain	-	-	-	-	-	-	-	-
3=Severe pain	-	-	-	-	-	01 (3%)	-	01 (3%)
Retention of restoration								
0=Retained	32 (100%)	32 (100%)	32 (100%)	32 (100%)	30 (94%)	25 (78%)	23 (72%)	20 (62.5%)
1=Partially retained	-	-	-	-	02 (6%)	04 (12%)	01 (3%)	03 (9%)
2=Loss of retention	-	-	-	-	-	01 (3%)	01 (3%)	-

Group-A: HALL Technique (HT)

Group-B: Conventional Restorative Technique (CRT).

Table II shows that in both groups, clinical evaluations were done after 3 months, 6 months, 9 months and 12 months of restoration.

In group A (HALL Technique) 6% of total cases represents mild discomfort and 3% of total cases reported mild pain after 6 months. No dislodgement of restorations occurred in this group. After 12 months of follow-up, no complaints were reported.

In group B (Conventional restorative technique) After 3 months 3% of total cases reported mild discomfort and 6% of cases complained partial loss of retention of restorations.

After 6 months, 12% of cases reported mild discomfort, 3% of cases reported severe discomfort, 3% of cases patients had mild pain, whereas 3% of cases had severe pain, 12% of cases reported partial retention loss of restoration, and 3% of cases complained loss of restoration.

After 9 months, 3% of cases patients had severe discomfort, 3% of cases reported partial retention loss and 3% complained loss of restorations.

After 12 months of follow-up, another 9% restorations were partially retained and 3% complained of severe pain.

Table III Final outcomes of restorations in primary molar teeth in both groups (n=64)

Final outcome	Group A		Group B	
	Frequency	Percentage	Frequency	Percentage
Success	30	93.8	20	62.5
Failure	02	6.2	12	37.5

Group-A: HALL Technique (HT)

Group-B: Conventional Restorative Technique CRT)

Table III shows higher success rate in group A 93.8% whereas 62.5% in group B. Table III also shows that failure rate is more in group B, which is 37.5% in comparison to group A 6.2%.

Table IV Comparison of the success of restoration among HALL technique and conventional technique (n=64)

Success	Technique		Chi-square value	p-value
	HALL	Conventional		
Yes	30	20	9.143	.005
No	2	12		

A Chi-square test was done to analyze the data. p value $\leq$ 0.05 considered as a level of significant.

According to Table IV the success rate of group A is higher than that of group B and the difference is statistically highly significant (p=0.005).

Table V Comparison of the success of restoration among males and females (n=64)

Success	Male	Female	Chi-square value	p-value
Yes	23	27	.044	1.000 (>0.05)
No	6	8		

A Chi-square test was done to analyze the data. p value < 0.05 considered as a level of significant.

According to Table V there is no relationship between success of restoration and gender of patients where p value is 1.000

Discussion

Management of carious primary molar in children is highly challenging and has poor long-term outcomes.⁴ In the past decades carious primary molar was treated by the conventional approach but the conventional restoration

was shown only moderate outcomes depending on the technique and the material used and on the ability of the child to cooperate because of age, cognitive development, pain perception and so on. Though the child's cooperation and behavior were ideal for the treatment, the restoration of their teeth still be a technically demanding exercise due to the size and morphology of primary teeth.⁷

In the current study, the sample means the age of children who received PMC using the Hall Technique was 5.62 ± 1.23 years of age and for Conventional restoration, it was 4.97 ± 1.17 years of age. This is consistent with the study demonstrated by, Ludwig et al. Innes et al where the mean age of children who received PMC using the Hall Technique was between 5.1 and 6.8 years.^{2,8} Another similar study conducted by Jawdekar and Thakkar is comparable with the present study where the HALL Technique showed better performance though this study comprised a comparatively higher age group (7-8) years instead of (4-7) years.⁹

They may prefer to include this age because this is the age of the most accessible population of school children, at this age children developed the ability to see others' points of view.

The current study compared the clinical success of the Hall Technique and the Conventional Restorative Technique and demonstrated that the Hall technique showed better performance at 1-year follow-up. Where in the present study results Group A (Hall technique) displayed significantly higher success 93.8% than Group B (Conventional Restorative Technique) 62.5% at 1-year follow-up. Similar results were reported by Kaptan and Korkmaz in a study for comparative evaluation of the clinical success of the Hall technique and Conventional restorations at 1-year follow-up.⁴ These results are also consistent with the study of Boyd et al who found SSC was the most successful restorative treatment placed with Hall Technique.^{2,10}

According to Midani, the higher success rate of the hall technique is due to the complete isolation of plaque biofilm from the oral environment and thereby slowing or arresting the carious lesion progression.¹¹ Salas et al also stated that glass ionomer cement used in the hall technique offered additional benefits in lesion remineralization.¹²

This result coincides with Innes et al. who conducted a randomized control trial that included 132 children of 3-10 years where 264 study teeth were selected and teeth were randomly treated with the Hall technique and with Conventional restoration with a minimum 48-month follow-up. They concluded the results with a 92% success rate for Hall Technique and 52 % for the control restorations.^{2,13}

The result of this study was also consistent with the study results of BaniHani et al. in terms of the high success rate of the biological approach (Hall technique or indirect pulp

capping) which was 95.8% although the Conventional method showed the same performance where the success was 95.3%.¹⁴ In this respect, the result of this study differed in a point from the current study that they did not find any advantage of the biological technique. This may be due to the use of composite resin in the case of Conventional restoration.

Conclusion

It may be concluded that; the application of the preformed metal crown using the Hall technique is a more effective method than the conventional restoration for managing carious primary molar.

Disclosure

All the authors declare no conflicts of interest.

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Curve of Spee and It's Relation with Various Malocclusion in Bangladeshi Population

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Abstract

Background: The curve of Spee commonly refers to the arc of a curved plane that is tangent to the incisal edges and the buccal cusp tips of the mandibular dentition viewed in the sagittal plane. The aim of this study was to evaluate the influence of malocclusion on the depth of curve of Spee in Bangladeshi young adult.

Materials and methods: This descriptive cross sectional study was done among the patients in the age group of 12-30 years at Dhaka Dental College & Hospital from January, 2017 to December, 2017. A total number of 100 patients were selected.

The depth of curve of Spee was measured as the perpendicular distance between the deepest cusp tip and a flat plane that was laid on the occlusal surface of the mandibular dental cast. The measurement was made on the right and left side of the dental arch and the mean value of these two measurements were used as depth of curve of Spee. The measurement were analyzed and statistically compared in SPSS version 20 by students "t" test ($p < 0.05$).

Results: In this study the minimum depth of curve of Spee was 0.75mm and maximum was 5.25 and mean was 2.16 mm. Mean depth of Curve of Spee in class I malocclusion was 1.82 mm, in class II div 1 malocclusion mean depth was 2.6 mm, in class II div 2 malocclusion mean depth was 2.9 mm, in class III malocclusion mean depth was 1.42mm. Among 100 patients, 44 patients had a normal curve of Spee, 17 had a deep curve of Spee and 39 had a flat curve of Spee.

Conclusion: The study concluded that the mean depth of curve of Spee was 2.16 mm. The depth of curve of Spee was deepest in class II div-2 malocclusion and flat in class III malocclusion.

Key words

Curve of Spee; Malocclusion; Mandible.

Introduction

Occlusal curvature is a naturally occurring phenomenon in the human dentition. Ferdin and Graf Von Spee found in the dentition of other mammals and fossil humans, a line of occlusion, which was termed as curve of Spee and was described in humans in the late 19th century the line of occlusion as the line on a cylinder tangent to the anterior border of the condyle, the occlusal surface of the second molar and the incisal edges of the mandibular incisors determine the curve of Spee.¹ According to the glossary of prosthodontic terms, curve of Spee was defined as the

anatomical curve established by the occlusal alignment of the teeth, as projected onto the median plane, beginning with the cusp tip of the mandibular canine and following the buccal cusp tips of the premolar and molar teeth continuing through the anterior border of the mandibular ramus and ending at the anterior aspect of the mandibular condyle. The curvature of the arc would relate, on average, to part of a circle with a 4-inch radius. However, "clinical" of curve of Spee in orthodontics differ substantially from original curve of Spee as defined by Spee and the definition of curve of Spee given in prosthodontic literature. A combination of factors, including growth of orofacial structures, development of the neuromuscular system and eruption of teeth, was suggested for development of the curve of Spee.² The presence of a curve of Spee of variable depth is common finding in the occlusal arrangement and is the sixth key of occlusion. Clinically in orthodontics today, the curve of Spee refers to the occlusal curvature of the mandibular dentition that runs tangent from the buccal cusp tips of the posterior molars to the incisal edges of the anterior incisors when viewed in the sagittal plane.³

It has been suggested that the mandibular sagittal and vertical position relative to the cranium is related to the curve of Spee, which is present in various forms in mammals.³ The morphological arrangement of the teeth in the sagittal plane has been related to the slope of the articular eminence, craniofacial morphology, lower incisor proclination, the incisor overbite, the molar cusp height and lower arch circumference.^{4,5,6}

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Spee et al recommended that the curve of Spee should be taken into account for the construction of dentures to provide better mastication and prevent a lever effect during function.¹ However, orthodontics differs from prosthodontics regarding the clinical significance of the curve of Spee.⁷ Andrews described the 6 keys of occlusion and found that the curve of Spee ranged from flat to mild in subjects with proper occlusion, remarking that the best static intercuspation occurred when the occlusal plane was relatively flat.⁸ He also stated that leveling and flattening of the curve of Spee should be the goal of treatment. This concept especially as applied to deep overbite patients, has been supported by others and produces variable results with regards to maintaining a level curve after treatment.^{9,10} It has been suggested that the deciduous dentition has a curve of Spee ranging from flat to mild, whereas the adult curve of Spee is more pronounced.¹¹

It has been reported that an excessive curve of Spee is associated with deep bite malocclusions.¹² Burstone stated that the treatment of deep bite might involve intrusion of maxillary anterior teeth, intrusion of mandibular anterior teeth, extrusion of maxillary and mandibular posterior teeth, or any such combination.¹² However, Schudy advocated that a deep bite and a deep curve of Spee should be corrected by extrusion of the molars because intrusion of anterior teeth has a high potential for relapse.¹³

There is a little consensus in literature concerning the measurement of curve of Spee. Baldridge used the perpendicular distance on both sides.⁶ Bishara et al used the average of the sum of the perpendicular distances to each cusp tip.¹⁴ Sondhi et al used the sum of the perpendiculars.¹⁵ Braun et al and Braun and Schmidt used the sum of maximum depth on both sides.^{5,16}

Exaggerated curve of Spee is frequently observed in dental malocclusion. According to Ahmed I mean depth of Curve of Spee in class I malocclusion was 2.4mm, in class II div 1 malocclusion mean depth was 2.8 mm, in class II div 2 malocclusion mean depth was 4.3 mm, in class II subdivision mean depth was 2.5mm in class III malocclusion mean depth was 2mm.¹⁷ The curve of Spee was deepest in class II div 2 malocclusion and flat in class III malocclusion.

In Bangladesh Malocclusion is one of the commonest aesthetic problems. According to Hossain MZ Class I malocclusion patient was 55.22%, Class II was 33.33%, (Class II div 1 was 28.85% and Class II div 2 was 4.48%), Class III was 8.46% open bite 0.99% and other nonspecific case 2% who were attending Dhaka Dental College in the Department of Orthodontics in the year of 1990-1991.¹⁸ According to Niaz A, Class I malocclusion patient was 45.84%, Class II was 39.88%, (Class II div 1 was 32.74% and Class II div 2 was 7.14%), Class III was 14.28% Who were attending Dhaka Dental College in the Department of Orthodontics in the year of 1992-1994.¹⁹ According to

Habib MA, Class I malocclusion was (61.8%) and Class I malocclusion was more in male (54%) than female (46%). Class II div 1 was 23% and Class II div 1 malocclusion was more in female (57.4%) than male (42.6%). Class II div 2 was 2.2% and Class II div 2 malocclusion was more in female (63.6%) than male (36.4%), Class III was 13% and Class III malocclusion was more in female (53.8%) than male (46.2%).²⁰

The presence of a curve of Spee of variable depth is common finding in the occlusal arrangement and is sixth key of occlusion. The understanding of curve of Spee in the field of orthodontics is very important as orthodontists deal with it in virtually every patient they treat. An excessive curve of Spee is a common form of malocclusion that may be addressed in many ways, including posterior extrusion, anterior intrusion, and incisor proclination. The specific approach to leveling of curve of Spee should be selected based on each patient's needs. The purpose of this study is to evaluate and compare the depth of curve of Spee in class I, class II div1, class II div 2 and class III malocclusion in Bangladeshi population between 12-30 years age. The influence of gender on the curve of Spee will also be investigated.

Materials and methods

This descriptive cross sectional study was done among the patients in the age group of 12-30 years at Dhaka Dental College & Hospital from January, 2017 to December, 2017.

A total number of 100 patients (57 female and 43 male) were selected according to inclusion criteria.

Inclusion criteria

- Healthy subjects having complete dentition
- All teeth are present except third molar
- Patients willing to participate comfortably
- Age ranges from 12-30 years
- The participant and their parents should be Bangladeshi in origin.

Exclusion criteria

- Anterior or lateral crossbite
- Remarkable malformations and structural deformity
- Congenital or acquired facial and dental defects
- History of orthodontic treatment
- Restorations or trauma
- Pathological condition and periodontal disease.

The sample consisted of four groups.

Group 1 class I malocclusion = 35 patients (Female =18, Male =17)

Group 2 class II div 1 malocclusion =25 patients (Female =15, Male =10)

Group 3 class II div 2 malocclusion =15 patients (Female =10, Male =5)

Group 4 class III malocclusion = 25 (Female =14, Male =11)
The depth of curve of Spee also divided into three groups:

Group A = Normal curve of Spee i.e. 2-3 mm

Group B = Deep curve of Spee i.e. >3mm and

Group C= Flat curve of Spee i.e. < 2mm.

Impressions were taken for all the patients and casts were prepared. The depth of curve of Spee was measured (Figure-1) with a digital Vernier Caliper as the perpendicular distance between the deepest cusp tip and a flat plane, that was laid on top of the mandibular dental cast touching the incisal edges of the central incisors and the distal cusp tips of the most posterior teeth in the lower arch as done by Braun et al and Braun and Schmidt.^{5,16} The measurement was made on the right and left side of the dental arch and the mean value of these two measurements were used as depth of curve of Spee.

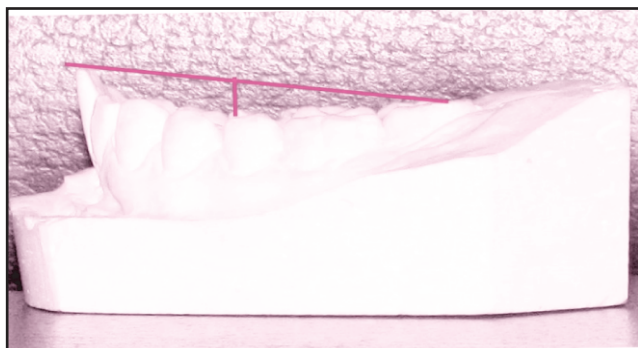


Figure 1 Measurement of curve of Spee

Results

In this study the minimum depth of curve of Spee was 0.75mm and maximum was 5.25 and mean was 2.16 mm. Mean depth of Curve of Spee in class I malocclusion was 1.82mm, in class II div 1 malocclusion mean depth was 2.6 mm, in class II div 2 malocclusion mean depth was 2.9 mm, in class III malocclusion mean depth was 1.42 mm as shown in Table I. Among 100 patients, 44 patients had a normal curve of Spee, 17 had a deep curve of Spee and 39 had a flat curve of Spee as shown in Table II.

In class I malocclusion cases, 42.86% had normal curve of Spee, 8.57% had deep curve and 48.57% had flat curve of Spee .

In class II div1 malocclusion cases, 60% had normal curve of Spee, 24% had deep curve and 16% had flat curve of Spee.

In class II div 2 malocclusion cases, 53.33% had normal curve of Spee, 40% had deep curve and 6.67% had flat curve of Spee.

In class III malocclusion cases, 20% had normal curve of Spee, 12% had deep curve and 68% had flat curve of Spee. In this study there was no significant relation between curve of Spee and gender. There was also no significant relation between curve of Spee and age in this study because this study was conducted in the age group from 12 -30 years and curve of Spee is stable throughout adolescence and adulthood.

Table I Minimum, Maximum and Mean Depth of Curve of Spee in Different Malocclusions

N □	Minimum □	Maximum □	Mean □	S.D. □	p-value □	Sig.
COS	□ 100 □	75 □	5.25 □	2.1600 □	89789 □	.000 S
COS In class I malocclusion □	35 □	1.00 □	3.25 □	1.8214 □	.57385 □	.000 S
COS In class II div 1 malocclusion □	25 □	1.50 □	4.50 □	2.6000 □	.74302 □	.000 S
COS In class II div 2 malocclusion □	15 □	1.50 □	5.25 □	2.9000 □	.95338 □	.000 S
COS In class III malocclusion □	25 □	.75 □	3.50 □	1.4260 □	.58757 □	.596 N.S.

COS: Curve of Spee, SD: Standard Deviation, N: Number, NS: No Significant, S: Significant, $p < 0.05$ = Significant, $p > 0.05$ = No Significant.

Table II Depth of Curve of Spee in Different Malocclusions

Class I □	Class II □	div 1 □	Class II □	div 2 □	Class III □	Total
Normal □	COS 2-3mm □	14 □	15 □	9 □	6 □	44
Deep □	COS >3mm □	4 □	6 □	5 □	2 □	17
Flat □	COS <2mm □	17 □	4 □	1 □	1 □	39
Total □	□	35 □	25 □	15 □	25 □	100

COS: Curve of Spee.

Discussion

In this study the depth of curve of Spee was deepest in class II div 2 malocclusion and was flat in class III malocclusion. This coincides with the previous reports that the radius of curve of Spee is shorter in those with class II malocclusion than class III malocclusion.^{21,22} Over bite and over jet significantly influence the curve of Spee . The depth of the curve of increases with an increase in over jet and over bite.²³ The results of present study confirmed the above finding as depth of curve of Spee increases in class II div 1 and 2 malocclusions in which there are increased overjet and overbite. Trauten et al and Orthlieb reported that there was a negative curve of Spee in open-bite cases, where as a deep curve of Spee in deep-bite cases was found.^{22,24} On the other hand, Farella et al found that the curve of Spee is more marked in short-face subjects and less marked in long-face subjects.²⁵ Similarly, we found that the curve of Spee is deepest in class II div 2 malocclusions that have deep overbite and short face heights (Low angle) than in the normal and flat Spee groups with class III malocclusion.

Shannon and Nanda found that Class II malocclusion had significantly deeper pretreatment curve of Spee measurements than Class I malocclusions which coincide with the present study.²⁶ The curve of Spee contributes to set up the anterior overbite and is favorable to the approach

of the maxillary and mandibular occlusal planes, in mandibular elevation. According to this concept, the depth of the curve of Spee in individuals with Class II malocclusion should be deeper than in individuals with clinically normal occlusion.²⁷ Andrews also suggested that one of the six keys to normal occlusion is the existence of a leveled occlusal plane or a mild curve of Spee, which was observed in the present study.⁸ An excessive overbite can be an indication of incorrect curve of Spee, in the same way, an exaggerated curve of Spee can be accompanied by an increased over bite.²⁸

The clinical evaluation should be associated and considered in orthodontic treatment planning. One of the orthodontic treatment purposes is leveling of the curve of Spee and for this leveling, the depth of the curve of Spee should be considered and quantified in space management procedures to prevent incisor flaring and consequently assuring aesthetics, stability of the treatment results and function.²⁹

Limitation

The present study had the following limitations

- ☐ Relative small sample size which is a limitation for statistical analysis and short duration.
- ☐ All measurement was done on study cast, it could be more accurate if it can be done on patient mouth
- ☐ Patients were not randomized.

Conclusions

The study concluded that the mean depth of curve of Spee was 2.16mm. Mean depth of curve of Spee in class I malocclusion was 1.82mm, in class II div 1 malocclusion mean depth was 2.6 mm, in class II div 2 malocclusion mean depth was 2.9 mm, in class III malocclusion mean depth was 1.42mm. The depth of curve of Spee was deepest in class II div 2 malocclusion and flat in class III malocclusion.

Thus in conclusion it may be suggested that clinicians should pay deep attention during treatment of respective malocclusions with different curve of Spee.

Recommendation

Future researcher to do additional depth research consisting of all other measurements and with large sample with proper mechanical support for greater acceptability of the study.

Disclosure

All the authors declared no competing interest.

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Radix Entomolaris: A Case Report of A Rare Anatomical Variation

Foysal Sirazee^{1*}

Abstract

Background: A comprehensive endodontic treatment includes the acts of locating the root canal orifice, chemo-mechanical cleaning and shaping the root canal system before placement of a dense root canal filling with a fluid-tight seal. Anomalies in the tooth are often encountered which poses difficulties in dental treatments. As in any other teeth, mandibular molars are also prone to anatomic variation. Morphologic variations in mandibular first molars are seen in the number of root canals or the number of roots. An additional third root, first mentioned in the literature by Carabelli, is termed as Radix Entomolaris (RE). This supernumerary root is located distolingually in mandibular molars, mainly first molars. An additional root at the mesiobuccally side is termed as Radix Paramolaris (RP).

Case Report: A female 18-year-old allented at Chattagram International Dental College on 2nd June 2023 with complained about severe pain in the mandibular left first molar (36) over the previous three days. During the electric pulp tester, a carious lesion was detected on the buccal surface with significant discomfort. The tooth's crown had a significant amount of radiolucency and an extra distal root outline was seen on radiographs. An instance of acute irreversible pulpitis of the left mandibular first molar (36) was diagnosed. This case report focuses mainly on the diagnosis and management of variable root canal anatomies like radix entomolaris and its management protocol.

Conclusion: A detailed knowledge of the occurrence of Radix Entomolaris, its structural variants, as well as radiographic and clinical diagnosis, will give the endodontist a better grasp of its complexity, ensuring good treatment outcomes.

Key words

Caries driven access; Pro taper file; Radix entomolaris; Radix paramolaris.

Introduction

Radix entomolaris, which was first identified by Carabelli, is one of the anatomical variations observed in a permanent mandibular molar. Radix entomolaris is a supernumerary root found on permanent mandibular molars distolingually. It is an anatomical variety that is commonly curved buccolingually. A tooth having a third distolingual root is known as Radix Entomolaris and if this root is positioned buccally, it is known as Radix Paramolaris.¹ The early detection of a radix entomolaris or paramolaris prior to root canal treatment is critical for facilitating the endodontic procedure and avoiding missed canals. A thorough knowledge of the morphology of root canal systems, including any abnormalities that can affect the outcome of the treatment, is essential for an endodontist. Nevertheless, variations in root and root

canal system anatomy may pose an extra challenge to the final result. The persistence of infection due to a missing canal or ineffective removal of germs and necrotic pulp remains during chemomechanical instrumentation may be linked to endodontic failure. To reduce errors and achieve endodontic success, it is crucial for us to be knowledgeable about root and root canal, particularly in cases involving the radix entomolaris.

A number of ethnic groups have a higher incidence of a distinct RE in the first mandibular molar: Europeans had an incidence of between 3.4 and 4.2%, Africans 3%, Eurasians and Indians less than 5%, Caucasians 4.2%, Mongoloids like Chinese, Eskimo and American Indians had an incidence of between 5% and more than 30% and the overall incidence in dental school patients in Germany was 1.35 %.² This is further reinforced by the findings of Chen et al. Song et al. and Gu et al. which found that Radix Entomolaris is highly prevalent in Asian populations, ranging from 5.8% to more than 30%.^{3,4} Mandibular first molars, the first permanent teeth to erupt in our oral cavity, are regarded as "the key of the occlusion" and contain a high number of deep pits and fissures on the occlusal surface. As a consequence, mandibular first molars with a high risk of caries are more likely to require endodontic treatment.^{5,6} Additionally, the permanent mandibular first molar is in charge of the occlusion's development as well as crucial physiological processes like chewing. It is typically the one that requires endodontic therapy the most. Therefore, it is crucial that the clinician be knowledge able about the various root and root canal anatomies of the mandibular first molar.^{7,8}

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Case Report

A female 18-year-old allented at Chattagram International Dental College, Chattogram, complained about severe pain in the mandibular left first molar (36) over the previous three days. During the electric pulp tester, a carious lesion was detected on the buccal surface with significant discomfort. The tooth's crown had a significant amount of radiolucency and an extra distal root outline was seen on radiographs. An instance of acute irreversible pulpitis of the left mandibular first molar (36) was diagnosed. To reduce pain and anxiety during the root canal process, an NSAID (Ibuprofen 800 mg) and sedative (Clonazepam 0.5 mg) were administered half an hour before beginning root canal therapy. An inferior alveolar nerve block (2% Lignocaine with 1:200000 epinephrines) was administered. Minimally invasive endodontic access such as caries driven Access cavity preparation was done via an endo-access bur, and canal orifices were found with a DG 16 endodontic explorer. Upon opening the pulp chamber, four distinct canal orifices were found. The root canals were initially negotiated using a K-file ISO #10 (Dentsply Sirona, Switzerland) and EDTA as lubricating paste in the watch winding movement. The working length of these canals was determined using an apex locator, Apex ID (Kerr Dental) and validated using radiographs acquired at various angles utilizing the SLOB (Same Lingual Opposite Buccal) approach. To make a smooth landing for the rotary file, the glyde path was extended up to K file ISO # 15 (Dentsply Sirona, Switzerland). The canals were cleansed with 5.25% NaOCl and 17% EDTA before being shaped with Pro Tapper gold rotary files from Dentsply Maillefer in Switzerland. Endo Activator (Dentsply Sirona, Switzerland) was used to activate a 5.25% NaOCl and 17% EDTA solution for continuous irrigation. A sterile cotton pellet was used for temporary filling, and the patient was advised to return two days later.

The patient was symptom-free at the following appointment. Temporary restoration was removed and then large quantities of 5.25% NaOCl and 17% EDTA acid were irrigated and finally activated with endoactivator. Following radiological confirmation, master cones were selected by positioning cones in accordance with the size of the most recent finishing file F1 and F2 utilized for the working length. Before obturation with a biceramic-based sealer (Angelus Bio C sealer) using appropriate Pro Taper F1 and F2 cones and Continuous Wave Compaction Technique (Down pack and back fill), canals were thoroughly dried with paper points. The final restoration was completed in the same visit using packable composite (Ever X posterior, Gc) and polishing with composite stone and one gloss polishing cup (Sophu, Japan).

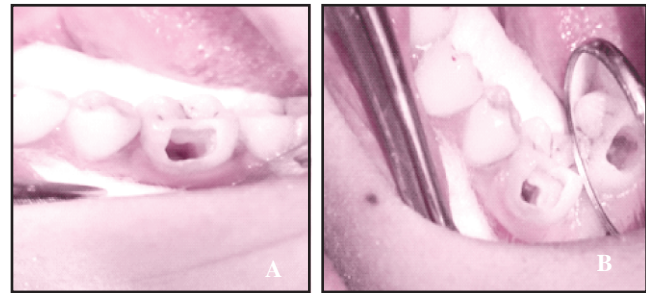


Image 1 A & B Minimally invasive endodontic access such as caries driven access cavity preparation

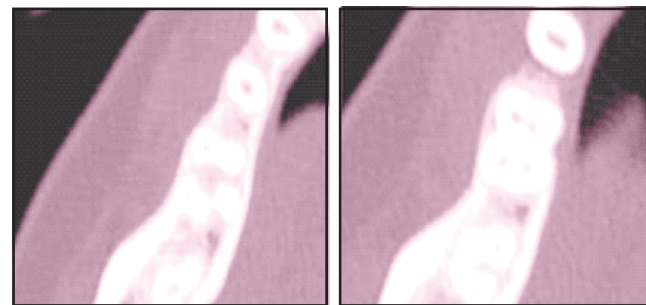


Image 2 REs according to the location in CBCT

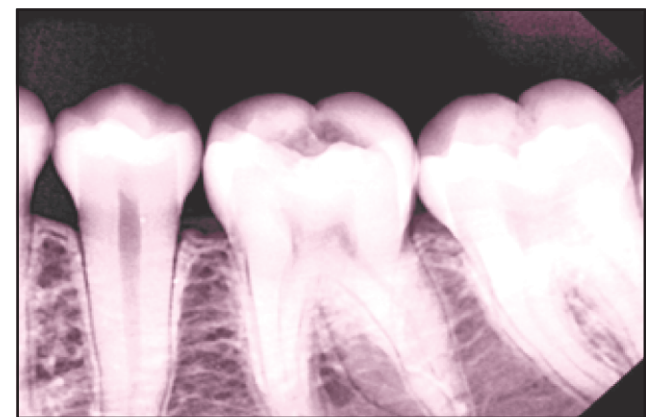


Image 3 Radix entomolaris was seen in periapical X-ray

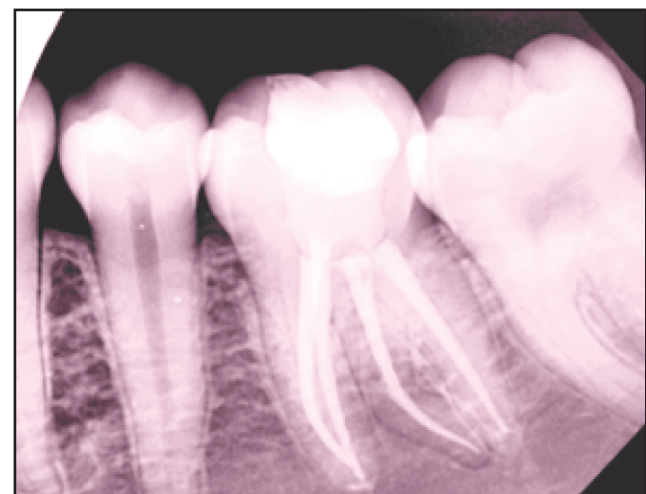


Image 4 Post obturation periapical xray showing radix entomolaris

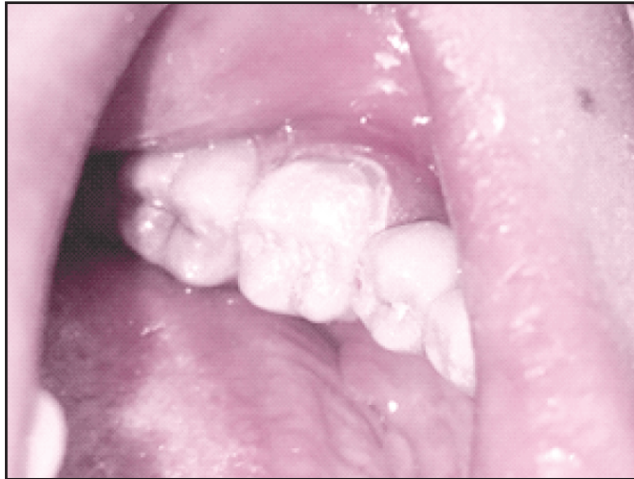


Image 5 The final restoration was done with packable composite and polishing with composite stone and one gloss polishing cup

Discussion

The precise reason for Radix Entomolaris development is unknown at this time. The presence of an atavistic gene during dentin development, for example, could influence the generation of dysmorphic supernumerary roots. The appearance of dysmorphic extra roots may be attributed to environmental influences during odontogenesis, penetrance of an atavistic gene or penetration of a polygenetic system (Atavism is the reemergence of a feature after several generations of absence). Racial genetic factors influence the more profound expression of a certain gene in eumorphic roots, resulting in a more dramatic phenotypic manifestation.^{1,9,10} Mandibular first molars typically have two roots, mesial and distal, with two mesial and one distal canal.⁹ However, the number of roots for mandibular first molar teeth may vary due to environmental influences during odontogenesis. The first to be reported were mandibular first molars with supernumerary roots. Radix Entomolaris (RE) was the name given to the third root, which was found on the disto-lingual side.¹⁰ The mandibular first molar may also have a second root, known as the radix paramolaris, on the mesio-buccal side. The second mandibular molars have the lowest occurrence of radix entomolaris among the first, second and third molars. According to studies, there is no discernible gender or side preference and bilateral prevalence is between 50% and 67%.¹¹

Various classifications has been proposed for categorizing RE based on the location of its cervical part, curvature of root canal and the length. Based on the location of its cervical part, RE is classified into 4 types and each type has a sub classification to identify RE as separate or non-separate Type A: Location of RE is lingual to distal root complex and has two cone-shaped macrostructure. Type B: Location of RE is lingual to distal root complex and has one cone-shaped macrostructure. Type C: Location of RE

is lingual to mesial root complex.¹² Type AC: Location of RE between mesial and distal root complexes. It can also be classified into various types I, II, and III based on the amount of curvature. Type I is a straight root/root canal, whereas type II is a curving entrance that continues as a straight root/root canal. Type II Curved coronal third which becomes straighter in the middle and apical third. Type III root canals have an initial curve in the coronal third and a second curve commencing in the middle and extending to the apical third.¹³ When treating such situations endodontically, having a thorough understanding of the intricate anatomical variations present in the first permanent mandibular molar is crucial. The visibility of root canal orifices can be significantly improved by magnification and illumination. The use of CBCT technology in endodontics extends beyond just identifying the number of roots, canals, and accessory canals and root shape.

All endodontic hand files must be pre-curved at the tip before entering a root canal in order to manage these types of root canal configuration. For the initial scouting file, such as K-file #10, small diameter and taper files should be used to offer crucial information about the extent and degree of curvature. Before shaping, the glide route should also be determined. This is done to make sure that shaping files travel smoothly to the apex.¹⁴ Ex vivo studies using micro-CT to evaluate the performance of various glide paths have revealed that rotary glide path systems result in fewer canal aberrations, faster canal transportation and shorter working times than manual glide paths employing hand instruments.¹⁵ To avoid debris buildup and canal blockage, adequate lubrication and periodic irrigation are required. When the coronal segment of the canals is sufficiently enlarged, obstructions are avoided and the endodontic file can easily pass from the coronal segment to the apical segment. Additionally, it would enable greater volume transfer of root canal irrigants to the apical portion. To determine the length and curve of the root, it is important to carefully examine radiographs taken at various angles and CBCT scans of the tooth. Electronic apex locators can be used in these situations to verify the root length. Additionally, the Pro Taper Gold system's progressive tapered shape ensures that the instrument engages with the dentine walls. This will lessen the stress on the file, the screw-in effect, and the taper lock.¹⁶ The geometry of the Protaper Gold is identical to that of the Protaper Universal, but it is more flexible and resistant to clinical fatigue. Particularly crucial when instrumenting root canals with bent apexes using thinner finishing files. To enhance cutting and lessen rotational friction between the file blade and dentine, a convex triangular part and a variable taper have been incorporated.¹⁷ In teeth with a suspicion of RE, clinicians can request angled radiography or CBCT before the process or use an operation microscope during a procedure.^{18,19}

Conclusion

Cases involving Radix Entomolaris necessitate the careful judicious application of diagnostic and endodontic skills for management, and it is essential to determine its nature in order to give the patient the right care. A detailed study of the occurrence of Radix Entomolaris, its structural variants, as well as radiographic and clinical diagnosis, will give the endodontist a better grasp of its complexity, ensuring good treatment outcomes. As a result, we, as endodontists, must be aware of its presence. A preoperative radiograph, particularly CBCT technology, as well as adequate angulation while taking radiographic images, become useful in detecting the additional root, and we must also pay attention to other anatomical features.

Disclosure

The author declared no competing interest.

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