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Journal of SAAPD

Inaugural Issue

The official publication of South Asian Association of Pediatric Dentistry

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JSAAPD

Journal of South Asian Association of Pediatric Dentistry (JSAAPD) is an online-only, peer reviewed, open access journal. It is an official publication of the South Asian Association of Pediatric Dentistry. It publishes its articles triennially in the last week of April, August and December. This journal aims for prompt publication of original research, case reports, and literature review in the field of Pediatric dentistry. It has been designed to include current, reliable and most complete information on latest developments in the field of Pedodontics and Preventive dentistry. It also provides a platform for the exchange of innovative and up-to-date ideas/ research performed by pediatric dentists of South Asia for benefit of the child's oral health. The editorial office promises peer review of the submitted manuscripts for the quality of publishing. It consists of a transparent review process which is performed by the editorial board members of JSAAPD or outside experts. At least two independent reviewer's approval followed by the editor is required for the acceptance of any citable manuscript. Editors can manage the whole submission/ review/ publish process.

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Editorial

Dear Friends in SAAPD!

I feel pleased to share with you the Inaugural issue of Journal of South Asian Association of Pediatric Dentistry. We aspire to become the scientific face of the Association and reflect the research and cases specific to the region. The Editorial team has put several months of hard work to being this to you at the time of First conference of the society.

According to DeBoer (1991), Research is learning towards learning by doing science, rather than merely learning about science. But if we acknowledge, the recent times, the essence of scientific research has been constantly changing. It has been witnessed to lack the dogmas of portraying science in a true manner. The scenario has been quite similar in the field of Pediatric Dentistry as well in the South Asian region. Planning a well-structured research exploring the oral health as well as the general well being of children of South Asian Subcontinent is the need of the hour.

In recent times, Pediatric Dentistry has been witnessing an exponential rise in publications relating to oral health research. It has been evident that most of the papers do get cited thus increasing the number and impact of scientific research. But what if more is BAD? It has been a belief that quality of research has been on a toss amid such growth. Pediatric dentistry has been the centre of extensive research globally. However, developing countries like India and other South Asian countries have been facing challenges in establishing effective research and preventive measures. Countries in this region with huge population and limited resources require research in a meaningful manner. We do not have coherent research for the region on prevention of Dental caries, Gingivitis, developmental defects and traumatic injuries etc. However, research covering all such issues is literally questionable. As discussed before, pressure to publish has also been a major contributing factor to poor or inappropriate research. Moreover, inbuilt system issues such as lack of infrastructure, fund/ grants and support from respective governing bodies have been proven to be few of the hurdles that are omnipresent. Also, inadequate guidelines from our journals may also affect the quality of research. It has been found that majority of our researchers are ignorant about the basic principles of carrying out research and do not follow the set international guidelines by STROBE/ CONSORT/ PRISMA. Such lacunae exist mostly because of lack of training programs describing how to conduct a research or write a scientific publication in this region. It has been also observed that a number of clinical trials are planned addressing the oral health issues of children but fail to register under organizations such as CTRI etc.

Therefore, focusing on oral health issues with an accurate research methodology is imperative. Let us formulate our own guidelines and topics of interest addressing the priorities of our region to conduct a meaningful research, which will improve the mankind's ability to preserve and maintain the oral health.

All the best.

Prof. Vijay Prakash Mathur
Editor in Chief

Message from the President

"DEEP-DYED HEALTH IS THE ENTIRE HEALTH OF THE CHILD FROM TOTS TO TEENS, BIRTH TO ADULTHOOD."

Dear Colleagues,

A warm welcome to you all! I would like to begin by stating how honoured I am to be serving as your President for **SAAPD**. I feel extremely blessed to be a part of our special profession and this distinguished alliance. I love being a paediatric dentist and I truly believe I am doing what God has designed and planned for me to do. I am excited to have this opportunity to serve my colleagues in this capacity and am tremendously optimistic for the future of the **SAAPD**!

The **South Asian Association of Paediatric Dentistry (SAAPD)** exists to support that drive that lives in each of us to be the "best of the best". It is a platform for experts to congregate for effective exchange of ideas and skills relying on the belief that every child has a fundamental right to his total oral health. It is a consortium of dental professionals catering to a variety of populations with the goal of building healthy communities of children and with a **vision** that oral health is the key to general health and quality of life.

As we all look ahead to this coming year, when we implement the new Milestone of **SAAPD** in 2017 with the purpose to expand awareness, eliminate stigma and provide support for the programs served by Integral Care - formerly known as **SAAPD**.We will focus on creating and promoting educational initiatives to our long-standing commitment to knowledge transfer through SAAPD'S Ist biennial conference going to be held in New Delhi from 4th to 6th May, 2018. We have created a *committee* who has been tasked with producing and vetting a curriculum that focuses on professional learning and education to the benefit of our members and the paediatric community at large.

Our time together is so valuable, and so limited, that we want to make it as useful to the association as possible. The website has been set-up in such a manner that it should be a way to readily communicate with the paediatric coterie, to facilitate the sharing of news & resources and promote activities. In the first year of our founding, we continue to be inspired by the passion and commitment we see in the paediatric society. As we move forward, ensuring it continues to be a scientifically strong, transparent and relevant society. We will therefore try to orchestrate our sphere as much as possible (practically and legally, by our by-laws) electronically before we meet.

The past year, we went through a deliberate strategic forethought process. As a result, the **mission** of this organization has been defined and focused.

"The **South Asian Association of Paediatric Dentistry (SAAPD)** is a non-profit organization of individuals primarily concerned with area(s) of practice, education and research related to the field of Paediatric Dentistry. It provides a platform for the Paediatric Dentists of South Asia to work together in spirit of friendship, trust and understanding for benefit of the child's oral health."

By contributing exceptional educational experiences to our members and optimal health care to children, which include the latest and most relevant topics within our specialty, we hope to continue to offer unique opportunities to our Paediatric Society. These opportunities not only provide education, but also provide collegial environments where ideas on the practice of paediatric dentistry can be exchanged openly with your peers from across the country. I encourage *every* member to take advantage of these opportunities! Your collective support makes it possible for us to make a difference.

As President, I am particularly interested in hearing from you- How can we continue to inspire your lifelong commitment to excellence within our profession and federation?
Each comrade of conglomerate is working very hard to improve and increase the value of our membership and association. Each of our founder working members is listed on our website for your convenience. We are an approachable, fun, and hardworking group that would be happy to address any questions or ideas you may have. Without the significant contributions of these individuals, our fraternity would not be a strong syndicate that it is as today. I would like to extend the deepest gratitude to each one of them.

Become a part of our expanding family in case you have not yet registered as a member
Our mission is clear and we are motivated! Please know that **"The SAAPD"** is here to help *'support your lifelong commitment to excellence and total oral health care for children'*.

I am sure you will keep our spirits high with words of encouragement and needed support for the growth of association. I also optimistic that we, together, will not be short of generating creative ideas in expanding the programs that directly benefit the association in future. With all your whack and liaison, **SAAPD**, I am sure, will grow and grow.

SAAPD is your association too. So, please feel free to guide and suggest us ways on how we can always better the lives of children we tirelessly serve. We will also keep you posted with the news and updates from our end.
Great words to live by! As individuals traveling the road of life, it is a difficult journey. Some live up to these words, but for most, life centres on our daily routine, moving from task to task without giving this path a second thought. For some, this is a way of life. But for me, this was second nature …

I never ceased to fight for that and never let us lose sight of that goal.My message to the young and newer paediatric dentists is to become active within the **SAAPD**, to share their thoughts, ideas, passions and opinions. Just engage, I would say, at any level possible, so we, as paediatric dentists may continue to do what's essential to keep our specialty strong. You are among a committed group of colleagues who have the same high standard of excellence and professionalism.

The Journal of SAAPD is an attempt to publish relvant research, opinions, cases and reviews particular relevant to the region. I hope that this scientific face of the society help all of us in knowing more and sharng more. Our Editorial team has put hard work to compile the inauguration issue with a beautiful cover page. I am thankful to the Editorial team for putting efforts to bring the journal on the day of inauguration.

Again, thank you so much for this opportunity to serve as your President. I am looking forward to a great year!Thank you for joining us on our journey and express a hope that we will find mutual inspiration in the development of our Alliance.

Dr. Virinder Goyal
President SAPPD

From the desk of General Secretary

Dear Friends,

It is a matter of great pleasure for the entire team of SAAPD, as they bring to you the first issue of the Journal of the association. With all due efforts, the dream to form aRegional organization catering to the South Asian population has finally been realized. The association aims to provide a platform, for the Pediatric Dentists of South Asian countries, to work together in a spirit of friendship, trust and understanding for the benefit of the children, and the society as a whole. The Society has established a useful and unique platform, to eradicate diseases of oral health in childrenthat involves cooperation among South Asian countries.

The Journal of SAAPD will act as a means, for effective exchange of ideas and skills, among dental professionals catering to various striates, across the nation. We hope to build a consortium, where one can benefit from the other, as a whole and services can be provided at a wider forum. This Journal wishes to receive and acknowledge, the various scientific researches carried out by dentists from across the South Asian subcontinent. As we all know that the prevalence and burden of oral diseases is high among the South Asian countries, still there is a lack of coherent scientific content and valuable researches, proving to be a limitation in instigating early treatment and prevention regarding the same. Through this Journal, we aim to bridge the gap between provision of treatment and the omnipresent diseases in our nations.

It is vitally important that, researcher in the field of Pediatric Dentistry have an international forum, through which they can share their work and experiences,especially when such information can help save or improve the status of oral health of children. In this era of digital world, this new open access online journal will strengthen the ties, between the international communities of Pediatric Dentistry.

There are extensive options for authors, to argument the presentation of their research in JSAAPD, for instance by including their underlying data presented in interactive graphs, or using 3-D visualization of work done.

“As children are the future of any country, a healthy oral cavity will definitely lead to a healthy body, making the future a prosperous and a progressive one”. With this thought,

I wish to place on record and express gratitude for voluntary scientific contribution, in editorial process made by editorial board, which is comprised of a well-balanced representation from each participant country, for the inaugural issue of the journal.

Finally, I hope and wish that this Journal will prove to be a valuable asset and will fulfil its purpose at large

Dr Gyanendra Kumar
Secretary

Original article

The Socio-demographic profile of children affected by Amelogenesis imperfecta and its impact on their families: a pilot study based on patients attending a Paedodontic clinic in Sri Lanka

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ABSTRACT

Aim: The appearance of teeth is fundamental to pleasing facial aesthetics and the health and well-being of a child. Amelogenesis Imperfecta (AI) is a disorder that affects the structure and appearance of the enamel of the teeth. The present pilot study aimed to assess the socio-demographic profile of children, affected by AI and its psychosocial impact on the families,compared to their non-affected siblings as perceived by mothers.

Method: Seventeen mothers with children affected by AI participated. The impact of the child's AI status on the family was assessed using a modified translated version of Family Impact Scale (FIS) which consisted of 27- items organized into 6 dimensions, namely parental/family impact, parental emotions, family conflict, impact on child in past/present context, perceived future impact on child and financial burden.

Results: Based on mothers respondents, the results revealed psychological impact as an overall score for 27 – items was 117.94 (±31.97) for affected families and the scores ranged from 62-174 which was significantly higher than the 0 score for controls. The highest median scores reported for *impact of AI on child's quality of life in past and present contexts* (median score= 39.0) and for *parental emotions* (median score=33.0). Mothers perceived a considerable impact of AI on child's quality of life in the future context as well (median score=21.0).

Conclusion: As emerged from the findings, there was a considerable perceived psychosocial impact on families reported by mothers having children with AI compared to their non-affected siblings. Thus it is important to provide necessary psycho-social support for those mothers.

Key words: Socio-demographic profile, Amelogenesis imperfecta, psychosocial impact

INTRODUCTION

Amelogenesis imperfecta (AI) is a rare inherited dental abnormality affecting the structure and clinical appearance of the enamel of both primary and permanent dentitions [1,2]. It could give rise to tooth disfiguration, sensitivity, tooth substance loss requiring life-long oral health care comprising of aesthetic dental treatment as well as oral hygiene improvement [3]. Hence, AI poses a challenge not only for affected children, but for their parents as well as oral health care system of the country.

The visible unaesthetic appearance of affected teeth with sensitivity by AI poses a significant psycho-social impact to affected children and adolescents such as negative self-perception, emotional disturbance, inhibited interactions, getting teased/ bullied, anxiety, low self-esteem, learning disabilities, low school achievement and social withdrawal [4,5,6,7]. Further, child's condition may have a negative impact on his or her family, predominantly the parents [8,9]. Therefore, AI could significantly influence the quality of life of affected children and their families, family impact assessment is important in this regard as highlighted by Locker et al., [7]. Despite, the great need for comprehensive assessment of the burden of AI in terms of occurrence, family impact and treatment; there is a dearth of information in respect to Sri Lankan patients. Such information is crucial for assessing the existing burden of AI in Sri Lankan context, to widen the existing epidemiological and clinical knowledge, as well as to plan efficient and effective oral health care services to the affected children and adolescents. Against this backdrop, present multi-component research study with a long-term follow up was aimed to address the remaining information gaps.

This manuscript is aimed to describe the psychosocial impact of having children affected by AI as perceived by mothers.

MATERIALS AND METHODS

All children with confirmed AI who presented to the Division of Pedodontics, Faculty of Dental Sciences, University of Peradeniya from January 2009 to December 2010 were included in the study. Hence, the non-probability consecutive sampling technique was used in this study. The condition was confirmed by clinic-pathological correlation. Accordingly, the sample consisted of 17 children affected by AI and 7 children from same families not affected by AI as the control group. The impact of the child's dental condition on the family was assessed by using: A pre-tested questionnaire which included the modified, translated version of Family Impact Scale (FIS) [7] for children with and without AI in the same family. This scale was used as there was no validated instrument to assess the impact of AI in Sri Lankan context. Content and Consensual validity of the translated modified scale was obtained by expert opinion.

Mothers were questioned on the perceived impact of child's disorder (AI) on the family and child's own quality of life over the past 6 months, as at present and in future context. Same questions were asked from the parents regarding siblings without AI (controls). However, the control group was less, as in some families all children were affected with AI.

The original English version of FIS was first translated into native Sinhala language and then back translated into English language by independent translators. It was pre-tested among maternal caregivers of children with Cleft Lip and Palate prior to corrective surgery who attended the Oral & Maxillo-Facial Unit, Provincial General Hospital Badulla, which provided a rural socio-cultural setting in Sri Lanka, similar to the study setting of the present study.

The original FIS of Locker et al., 2002 comprised of 14-items in 4 dimensions but the modified, translated FIS consisted of 27-items organized into 6 categories. Namely, parental/ family impact (5-items), parental emotions (4-items), family conflict (3-items), perceived impact on child at present and in the past (10-items), perceived future impact on child (3-items) and financial burden (1-item). Each item had a frequency score as, never = 0, once or twice = 1, sometimes = 2,often = 3 and all the time = 4 and severity score as never = 0, a little = 1, quite a bit = 1, very much = 2. Hence for each item the frequency score was multiplied by respective severity score to arrive at the final score. Accordingly the scores for each item irrespective of the category to which the respective item belonged to could range from 0-12. In the present analysis the total score was computed for each dimension rather than considering individual items to reflect the composite picture.

Data were entered using Excel spreadsheets and analyzed by SPSS-21 Statistical Software Package. Descriptive statistics were used to describe the results.

Ethics approval for the present study was obtained from the Faculty Research Committee, Faculty of Dental Sciences University of Peradeniya (RERC/2009/11/HERATH1).

RESULTS

Table 1: Socio-demographic Profile of children diagnosed with AI

Feature	Number (%)	
Age distribution (in years)		
1-5	1 (5.9)	
6-10	4 (23.5)	
11-15	11 (64.7)	
>15	1 (5.9)	
Gender distribution		
Male	7 (41)	
Female	10 (59)	
Race		
Sinhala	11 (64.7)	
Moor	4 (23.5)	
Tamil	2 (11.8)	
Parental education	Mother	Father
Primary	1 (5.9)	0 (0)
Secondary	1 (5.9)	3 (17.6)
GCE (O/L)	8 (47.1)	7 (41.2)
GCE (A/L)	5 (29.4)	5 (29.4)
Degree/diploma	2 (11.8)	2 (11.8)
Sub type of AI		
Type1 (hypoplastic)	3 (17.6)	
Type II (hypomaturation)	1 (5.9)	
Type III (hypocalcification)	5 (29.5)	
Type IV (hypomaturation-hypocalcification)	8 (47.0)	

The mean age of the sample was 11.29 (±3.38) years, ranging from 3 years to 16 years. Thus, majority of children with AI presented in the mixed dentition stage (Fig 1). With reference to level of education acquired by parents, mothers were less educated compared to fathers. Majority of mothers (64.8%) were housewives, looking after family and engaging in household chores. Among fathers, the majority (64.7%) were employed as skilled/unskilled workers, 23.5% as professionals and 11.8% as businessman. Overall, based on educational attainment and occupational status of parents, the children with AI belonged to low to middle socio-economic status.

Table 2: The Mean ± SD, Median and Range scores of dimensions of modified translated version of Family Impact Scale

Dimension	Mean Score	± SD	Median Score	Range
Parental/Family Activity	9.17	±6.26	8.0	2-24
Parental Emotion	33.59	±7.01	33.0	24-45
Family Conflict	4.41	±5.29	3.0	0-19
Perceived impact on Child's quality of life in the past & present	39.00	±18.03	39.0	10-73
Perceived Impact on Child's quality of Life in Future	21.00	±5.12	21.0	12-28
Financial Burden	10.76	±1.85	12.0	6-12

Based on maternal respondents, psychological impact of the condition can be presented as the mean overall score for 27-items of the scale as 117.94 (± 3.19) and the scores ranged from 62-174. The parental/family activity category scores ranged from 2-24 with the mean of 9.17 (±6.26), and the median score was 8.0. Parental emotion scores ranged from 24 to 45 with mean 33.59 (±7.01), and a median score of 33.0. The family conflict scores ranged from 0-19 with the mean of 4.41(±5.29), and a median score of 3.0. Moreover, impact scores of AI on child's quality of life in past and present context as perceived by parents ranged from10-73 with the mean of 39 (±18.03) and a median score of 39.0. Furthermore, perceived future impact scores on child's quality of life ranged from12-28 with the mean of 21 (±5.12) and a median score of 21.0. The single item perceived financial burden ranged from 6-12 with the mean of 10.76 (±1.85) and a median of 12.0 (Table, 2).

The reliability of the 27-item FIS scale was assessed by internal consistency,as shown by Cronbach's alpha, whichreported a highly acceptable value of 0.83.

Interestingly, in the control group of siblings not affected by AI theimpact scores for ll6 dimensions were reported as 0.

Figure 1: Two patients who presented with Hypoplastic type of AI

DISCUSSION

The present study aimed to explore the socio-demographic profile of children affected by AI and its psychosocial impact on the family compared to their siblings (normal children in the same family) not affected by AI as perceived by their mothers. However, the results should be interpreted cautiously as the study has inherent limitations such as small sample size and use of modified translated version of Family Impact Scale (MTFIS) of Locker, 2002[7], which needs further methodological assessment with validation using a large sample of parental caregivers of children affected by similar conditions. However, in the absence of any published studies on psychosocial impact on families having children affected by AI in Sri Lankan socio-cultural context, present study addresses an important information gap.

All dimensions and sub-dimensions of FIS were affected by having a child with AI as described my mothers. The most affected dimension based on frequency-severity score was mothers' perceived impact on child's quality of life in past and present context, parental emotion and mothers' perceived impact on child's quality of life in future context. The perceived negative impact was relatively low for financial burden, parental/family activity and family conflict dimensions compared to other dimensions (Table, 2). The highest median score reported for impact of AI on child's quality of life in past and present contexts as reported by mothers demonstrated the burden of the disorder (AI). Importantly the parents perceived considerable impact of AI on child's quality of life in future context as well (median score of 21.0). These findings corroborated with the considerably high scores on parental emotions dimension of FIS with a median score of 33.0. As the majority of children were adolescents (Figure 1), the findings reflected how mothers were worried about their children affected by AI going to achieve the life goals as young adults in future. Adolescence is a period of life for increased attention for appearance and grooming. Against this backdrop, Parekh et al., 2014[5] conducted a qualitative explorative study among children/ adolescents affected by AI. Findings revealed that there is marked aesthetic, functional and psychosocial impact of having AI among children and adolescents.

The visible unaesthetic appearance of AI affected teeth compounded by sensitivity, poses a significant psycho-social impact to affected children and adolescents, such as negative self-perception, emotional disturbance, inhibited interactions, being teased/bullied, anxiety, low self esteem, learning disabilities, low school achievement and social withdrawal [10,11].Coffield et al., 2005[10], reported that having AI, impacted on the psychosocial health of affected people, especially at younger ages such as, social avoidance and distress, higher levels of discomfort, dysfunction and high fear for negative evaluation. Moreover, there is evidence to support that oro-facial and dental anomalies affecting aesthetics of teeth could be an important cause for children and

adolescents being bullied at school and even at home environments [11].

The lowest median score (3.0) reported for family conflict dimension followed by family / parental activities dimension (median score of 8.0) could be probably attributed to cohesive nature of families in rural Sri Lanka, despite having a child with AI. Similarly, the relatively low impact scores (median score=12.0) for financial burden could be due to availability and accessibility to public dental care services free of charge at the point of delivery.

The high Cronbach's alpha value of the 27-item, modified, translated FIS provided evidence for suitability of this scale for group comparisons.

In conclusion, present study revealed that children affected by AI who attended the Division of Paedodontics belonged to low and middle socio-economic backgrounds. As reported by mothers, there was a considerable family impact due to AI status of the child especially for perceived impact of quality of life of the child in past, present and future as well as on parental emotions. There is a need for further studies in this regard with methodological refinement. Affected mothers and families should be provided necessary emotional support to overcome their suffering including comprehensive, long term restorative and preventive dental care provision. Paediatric Dentists should pay their attention, not only for providing successful restorative dental treatment and oral hygiene improvement of affected children but the psychosocial impact of their families as well.

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Invited Review

Restorative Solutions for Anterior Teeth in Early Childhood Caries

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ABSTRACT

Early childhood caries can often result in total destruction of primary anterior teeth. There is a plethora of options for restoring such teeth. However, there is insufficient clinical evidence to suggest that one type of restoration is superior to another. The article aims to review the past and recent restorative options for restoring primary anterior teeth affected by early childhood caries, based on their in-vivo clinical performance over a period of time. The electronic databases and hand-performed journal searches identified 46 relevant documents. The variables to decide the long term outcome of the restorative material chosen were operator preferences, esthetic demands by parents, the child's behavior, amount of remaining tooth structure and moisture and hemorrhage control. A lack of long term, controlled clinical data prevents the validation or endorsement of any of the restorative options for repairing carious or traumatized anterior primary teeth.

Key words: Early Childhood Caries' 'Primary Incisors' 'Restorative Dentistry' 'Esthetic'

INTRODUCTION

Infants and toddlers with caries experience have a high risk for subsequent caries in primary and permanent dentition as well. The consequence of Early childhood caries results are destruction of primary maxillary incisors, which further effect the chewing efficiency, loss of height, development of tongue-thrusting and/or mouth-breathing, speech disturbances, and psychological behavioural complications. Therefore, integrity of the primary dentition should be preserved until they exfoliate normally. [1] Primary maxillary anteriors and first molars are involved while the mandibular primary incisors remain unaffected. [2,3]

Restoration of primary teeth carious lesions is challenging due to the dimensional assortment compared with permanent dentition, lesser surface area for bonding as well as issues related to child behaviour and cost of treatment. In a literature review by Lee in 2002 , data was scarce on the longevity of these restorations in a clinical setting.[4] Waggoner (2015) further elucidated that behaviour management, age of child,parental consent and difference in caries risk are the probable obstacles for the longevity of restoration of primary anterior teeth in clinical set up.[5]

Given the mentioned snags, management of ECC requires high impact and resource requirement to make astute decisions to choose the restorative material for the children

The aim of this article is to review the past and recent restorative options for restoring primary anterior teeth affected by early childhood caries, based on their In-vivo clinical performance over a period of time.

MATERIALS AND METHODS

1)SELECTION CRITERIA FOR ARTICLES CITED

All in-vivo randomised clinical trials with a follow-up of not less than 9 months were included in the review. Any meta-analyses and case reports with results based on a follow-up of less than 9 months were excluded. Only studies citing ECC as a reason for restorative procedure were included.

2)SEARCH STRATEGY AND DATA EXTRACTION

The following databases were searched for English language literature from 1997-2017: MEDLINE (via PubMed), Cochrane Library, EMBASE (Elsevier Science), Google Scholar, EBSCOhost and Wiley Online Library. To identify relevant studies, we used the following key words: 'Early Childhood Caries' 'Primary Incisors' 'Restorative Dentistry' 'Esthetic'. We also did a hand search of relevant journal published articles in gray literature with no subsequent reports.

3) DATA COLLECTION AND ANALYSIS

A total of 238 references were identified and, after adjusting for duplicates or supplementary reports, 159 remained. 113 of the citations clearly did not meet the selection criteria for this review and were discarded. The full text of the remaining 46 records

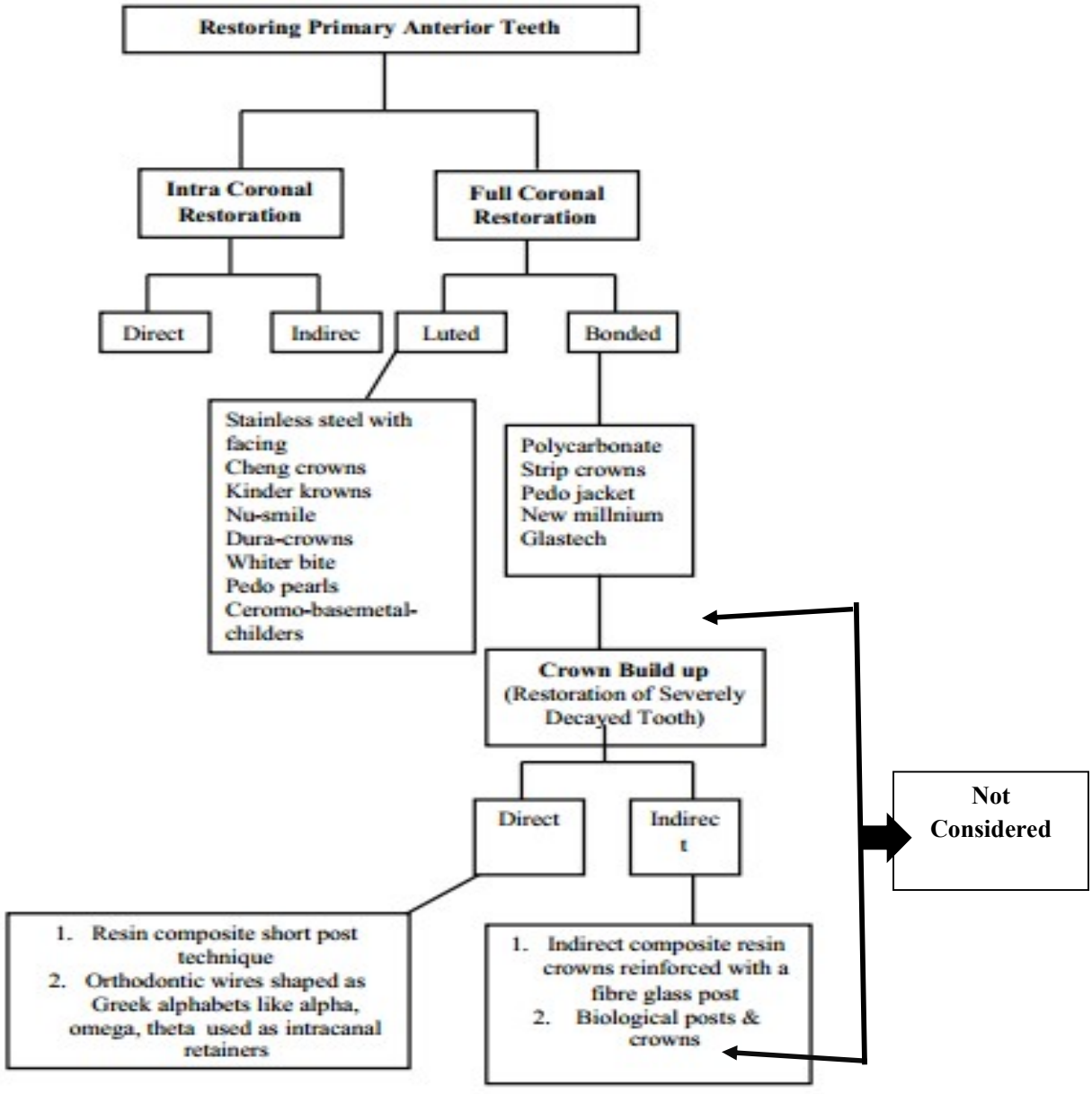
was retrieved, screened in greater detail, and assessed for eligibility. The selected articles reported results based on Likert scales and evaluation of sensitivity and specificity.

Independent reviewers performed extraction of data and the quality assessment. Cochrane's Collaboration's Risk of Bias Tool and AMSTAR-2 were used to judge the strength of evidence based on the validity of the results.

Restorations for primary anterior teeth were considered under two main categories- Intracoronal and Full coronal restorations. [6] (Table 1)

Intra-Coronal Restorations

A total of 18 relevant articles were shortlisted in which the following restorative materials were included: (1) Conventional Glass ionomer cements composite resin (2) compomers, (3) resin-modified glass ionomers, and (4) Composite resin for primary anterior teeth (Class III and Class V)



Most of the authors reported that the dimensional variations of primary dentition like lesser thickness of enamel, proximity of pulp horns to the interproximal surfaces, smaller size of crown prove challenging for performing the restorative techniques. Preparations which are conservative in depth with close attention to detail for material placement is required to restore the interproximal caries.[4] Some authors suggested that conservative preparations like slot preparation were not effective. In many instances, the retention of very small Class III restorations was questionable due to small surface area available for etching and bonding. Eight articles recommended that small Class III restorations with a labial or lingual dovetail incorporate a large surface area for bonding to enhance retention. This could entail veneering the entire labial or lingual surface as part of the restoration. Piyapinyo and White conducted an in vitro study which reported that incorporation of 0.3 mm deep labial reduction to simulate a veneer-like preparation in Class III cavity preparation exhibited greater bond strength.[7]

On the other hand, two clinical studies of 24 and 12 months duration, respectively, demonstrated that there were no clinically significant difference between primary incisors that had been restored with Class III slot cavity preparations versus Class III preparations with dovetails. [8,9]

Placement of Class III restorations is also technique sensitive due to moisture and haemorrhage control from the gingiva, and retention of the rubber dam.[5]

Various restorative materials have been utilised for Class V cavitated lesions. Croll et al reported resin modified glass ionomer cement had a 98% success in Class V and for 100% success rate in Class III placed in anterior teeth with an average duration of 4.5 years. [10] A clinical trial done in 3-5 year old children including 94 deciduous anterior teeth showed retention rate of compoglass, composite resin and glass-ionomer as 95%, 21%, and 12.5%, respectively over a period of 9 months. [11] It was suggested that the low success rate of composite could be due to the thinner enamel and less mineral content in primary teeth than the permanent teeth

Another clinical trial reported that comparable clinical outcomes were seen when efficacy of composite resin and resin-modified glass ionomer cement (RGIC) were evaluated for class III restorations in 80 primary anterior teeth for 12 months using Ryge criteria. [12] Another study reported that the survival rate after 18 months follow up was found to be 90.3% for RMGIC, 100% for compomer restorations and 80.6% for composite resin restorations in primary teeth according to the FDI criteria in 31 patients. [13] In RMGIC group there was statistically significant increase in surface roughness, colour mismatch, anatomic form loss and marginal deterioration. Failure of restoration composite resin group was due to restoration fracture.

The morphology of primary teeth has been under scrutiny for aiding in the retention of restorative materials. A study reported that the difference in time allotted for mineralization–1 year in the primary incisor and 7 to 8 years in the permanent incisor resulted in lower degree of microcrystal arrangement in primary teeth. [14] Moreover, the prismless layer of primary teeth may not respond well to acid etching. Corniff and Hamby recommended that enamel's should be removed by a diamond bur before acid etching to increase surface area, mechanical locks or slots which will prevent dislodgement of restorations. [15]

Despite the presence of a gradient of mineralization, dentin of the primary teeth is less mineralized. This results in thicker hybrid layer that is not completely penetrated by the bonding agent and lower bond strengths in primary teeth. Nör et al recommended shorter etching time for primary dentin to reproduce the hybrid layer as it more reactive to acid etching than permanent teeth.[16]Another study observed through SEM that a resin-reinforced hybrid layer was formed in primary teeth with total-etch technique of 15 seconds etching time . [17]

For many clinicians composites were the first choice for restoring anterior teeth due to their strength, wear resistance, esthetics and color-matching capabilities when compared to all the materials. But these materials were most technique sensitive as mentioned above.

Compomers have an advantage of fluoride release and more moisture tolerance than composite resins. Resin-modified glass ionomers release fluoride, do not require etching, and are less moisture sensitive. But aesthetics are not as good as compomers or composite resins.

On the other hand, GIC was not a popular choice due to poor esthetics and strength, except for Atraumatic Restorative Technique (ART).

Full Coronal Restorations

Over the last decade parents expect a higher esthetic standard for their children's primary teeth. We found a total of 28 relevant articles pertaining to such restorations in primary anterior teeth, and their in-vivo performance with a selection criteria as given by Waggoner.

According to Waggoner, full coronal restoration are required when a) caries is present on multiple surfaces b) incisal edge is involved c) extensive cervical decalcification d) pulpal therapy is indicated e) High-risk patients f)

incisors having large single surface restorations g) hypoplastic teeth h) poor moisture or hemorrhage control . [5]

The various options available for full coronal restorations are documented as under-

1) STAINLESS STEEL CROWNS

Stainless steel crowns although considered to be the most durable, economical and reliable method of restoring severely carious and fractured primary incisors as documented in literature of past 5 decades, may be completely unacceptable and rejected by a majority of parents for their child's anterior teeth, in present times.

MODIFICATIONS OF STAINLESS STEEL CROWNS

Preveneered Stainless steel crowns (PVSSC)

Various Preveneered SSC (Cheng crowns, Kinder crowns, Pedo Pearls Nu-smile and Whiter biter, Pedo Compu crowns and Dura crowns) crowns were developed to serve as an alternative solution for esthetics. However, no long-term clinical studies were found to match their performance over other restorative options.[19,20]

Similiarly, Dura crowns and Kinder crowns have been documented as case studies in literature wherein Kinder crowns were preferred due to pleasing shades available. [21,22,23]

Disadvantages of Preveneered crowns are costly and entire replacement of crown if facing chips or breaks. But the retention rate was 90% after six to 17 months. [5]

In a clinical trial Dhillon, Hughes and Mobley reported 96.8% PVSSC restorations were successful as compared to 80.8% success rate for Resin Bonded Strip Crowns restorations when compared the clinical and radiographic success in 57 primary maxillary incisors .[24]

However, studies have shown 12% to 39% of wear or partial facing loss, and 24% total loss of the esthetic facing of PVSSC. [23,25,26]

2) BONDED CROWNS

a) Strip Crowns

Webber et al in 1979 introduced bonded strip crown which was preferred esthetic restorative option for carious primary incisors. [27] The prevalence of use of strip crowns by pediatric dentists ranges from 45-73%. [28] However, it is also technique-sensitive and adequate tooth structure must remain for sufficient surface area for bonding and retention. Therefore, longevity of the crown is questionable, if a lot of tooth structure is absent. [29] Retention can be achieved by using mini pins as suggested by Carranza, and Garcia-Godoy suggested use of mini pins for retention. [30] Judd et al reported no failure of retention in one year when composite resin short posts were used in 92 pulpectomised anterior teeth. [31] Alternatively, a technique using an omega-shaped stainless steel wire hooked into the root canal opening was also suggested.[32]

Despite the popularity of composite resin strip crowns, the literature on long term clinical efficacy is limited. The vast majority of clinical studies that evaluated strip crowns were retrospective. [33-38] Retrospective data can provide useful information especially when the number of existing prospective clinical trials is limited . [39-41] All the above studies reported an overall retention rate above 80% after 18 to 24 months.

OTHER RESIN-BONDED CROWNS

Other alternatives are also developed other than the celluloid crown form that has been used for strip crowns. [20,42]

Composite Shell Crowns:

Updyke and Sneed described an indirect technique custom made composite shell crowns for aesthetic restoration of the maxillary anterior teeth [43], which will allow the restoration of multiple teeth at the same time by carrying out the restorative process on cast. The advantage of this technique was, no need for post cementation adjustment as the occlusion on lingual aspect can be checked on the cast. [19]

Polycarbonate Crowns:

Most of the authors found these crowns are least resistant to fracture or dislodgement due to strong abrasive forces. There are no long-term studies of polycarbonate crowns available and their use is very limited today. [5,45,46]

Pedo Jacket:

The performance of Pedo Jacket crowns in 129 children over a 12-month follow-up in a prospective clinical trial showed an overall clinical success of 89.5%. Discoloration, wear, or complete loss of the crown were found in 13.1%, 5.4%, and 7.6% of children, respectively. Although not statistically significant, failures were found to be associated with poor patient cooperation, oral hygiene, or operator error. The authors concluded that the crowns were easy to use, and are a viable treatment alternative for carious primary anterior teeth. [47]

New Millenium

Only three studies were found which suggested that these crowns can be finished and shaped with a highspeed bur and they concluded that when the crown is placed onto an inadequately reduced preparation they easily crack. [19-21]

Artglass Crowns

Updyke reported that out of 95 Artglass crowns that were evaluated using FDI criteria for clinical

performance, 79 received Alfa (representing clinically ideal), 11 received Bravo (representing clinically acceptable), and 5 received Charlie (representing clinically unacceptable) ratings over a 2 year follow up. The majority of failures were due to bond failure. [47]

C) ZIRCONIA CROWNS

Zirconia crowns are relatively new in the practice of pediatric dentistry and are recommended for anterior and posterior teeth due to their strength, durability and esthetics.

There is a learning curve in the placement of pediatric zirconia restorations. These require a feathered margin as in other crown preparations;but also need more tooth reduction when compared to strip crowns and SSCs. . Unfortunately,these preformed crowns cannot be crimped, and their retention is reliant on the internal surface designs and cementation dependant on operator skill. [48]

Table 2 lists the Zirconia crowns currently available for the primary dentition. [49]

Only few studies evaluated the clinical performance of zirconia crowns. Walia et al conducted a randomised clinical trial, including 129 teeth in 39 children of age 3 to 5 years reported that the retention rate was highest for zirconia crowns (100%) followed by preveneered SST crowns (95%) and strip crowns were found to be the least retentive (78%) in carious and traumatised primary maxillary incisors.[50]The low retention rate of strip crowns was attributed to in healthy tooth structure remaining and technique sensitive procedure.

Salami et al (2015) reported that the parental satisfaction with zirconia crowns was highest when compared with strip crowns and preveneered SSCs.[50] A retrospective study reported that 96 % of crowns were intact and 36% had gingival inflammation and color mismatch in 20.8 months follow up.[51] Inflammation was attributed to poor oral hygiene as 86% of crowns had closed margins. No recurrent caries or opposing tooth wear was noted.

Company	Form	Availability	Shades	Internal surface
NuSmile ZR (NuSmile Pediatric Crowns, Houston, Texas)	Right/left in upper centrals, laterals, canines and lower canines Universal contour in lower incisors	Upper central, lateral, canine, lower canine and lower incisors	Two shades	Intaglio surface
Cheng Crowns (Peter Cheng Orthodontic Laboratories, Inc., Exton, Pennsylvania)	Right/left	Upper central, lateral, canine and lower canine	Two shades	Crimp-lock retentive design
Kinder Krowns (Mayclin Dental Studios, St. Louis Park, Minnesota)	Available in universal contour and right/left	Upper central, lateral, canine and lower canine Two models available: Original and LP (less prep) Offered in short and regular lengths	Two shades	Internal retention bands
EZ Pedo (EZ-Pedo, Inc., El Dorado Hills, California)	Right/left in upper incisors Universal contour in lower incisors	Upper central, lateral, canine and lower universal Narrow length available for canine	One shade	Zir-Lock Ultra grooves

TABLE 2: Zirconia Crowns for Primary Teeth [49]

A recent in-vitro study by Shobber and Alkhadra reported, when four commercially available primary anterior esthetic crowns were subjected to force with crosshead speed of 1 mm/min until they fractured, NuSmile Zirconia crowns showed the highest load to fracture (937.36 + 131.68 N), while Preveneered Cheng Crowns showed the lowest (415.57 + 12.28 N)[52].

OTHER CERAMIC-BASED CROWNS:

CEREC crowns

All ceramic crowns use CAD/CAM technology for their fabrication. The whole procedure can be completed in a single visit. No clinical evidence of their performance was available that fitted in a long term study.

CONCLUSION:

A wide array of esthetic options exist for the pedodontist to restore carious primary incisors,but due to limited controlled, clinical data it is difficult to suggest any one superior restorative material. However many dentists have been using many of these options for years with much success. The variables to decide the long term outcome of the restorative material chosen are operator preferences, esthetic demands by parents, the child's behavior, amount of remaining tooth structure and moisture and hemorrhage control.

Meanwhile, clinical long term in-vivo studies of all newer restorative materials are definitely warranted,to establish that these tend to stay as the best available options for restoring anterior teeth in ECC.

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Original article

Questionnaire on HIV/AIDS related knowledge among undergraduate dental students and dentists

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ABSTRACT

Background: As dental students and practitioners are involved in care of HIV / AIDS patients, it is essential that they have knowledge of this disorder.

Objective: To assess the knowledge of undergraduate students, interns and dentists regarding HIV /AIDS through a questionnaire.

Methods : A self-administered questionnaire on HIV/AIDS completed by 136 BDS students, interns and dentists was analyzed. The participants were grouped as Pre-clinical (Group A), Third Year (Group B), Final year (Group C) BDS students and Interns and Dentists (Group D).

Results : A majority knew the full form of AIDS and the common modes of HIV transmission i.e. sexual, mother-to-child, contaminated needle and blood products. All groups ranked commercial sex workers to be at the highest risk. Dentists were ranked lowest risk by Group A, second highest risk by Group B and third highest risk by Group C and D. The majority identified recapping as a cause of needlestick injuries. The knowledge of management of needle stick injuries including consultation with experts and post-exposure prophylaxis was unsatisfactory in all groups. Information on management of blood spills in the workplace was inadequate while disinfectants were recommended by the majority in Group B and D. Most students know the clinical feature of AIDS as Candidiasis, Kaposi's sarcoma and Oral Hairy Leukoplakia. Knowledge about anti-retroviral agents was also unsatisfactory. Use of surgical gloves for prevention of transmission of infection was indicated by all groups while Group B, C and D also identified the need to wear gowns, masks, eye protection (goggles). The participants perceived that reduction of HIV/AIDS could be achieved by public awareness, needle-safety practices, safe sex and safe blood transfusion.

Conclusion: The study highlights lack of adequate knowledge of students and interns about HIV and various aspects of occupational exposures to potentially infectious material.

Key words: dentistry, immunodeficiency, prevention, occupational exposure.

INTRODUCTION

The Joint United Nations Programme on HIV/AIDS estimated that 34 million people were living with HIV in 2010. While it is the leading cause of death among 15-59 year old persons worldwide, a striking decline in AIDS deaths has been observed due to rapid evolution of successful treatment with Highly Active Anti-Retroviral Therapy. A sizeable proportion of these patients are children.[1] Therefore, all dental specialities, at some time or the other, deal with this subset of patients and the unique problems they present in the dental workplace.

The microenvironment of the dental health care team's work entails performing procedures with sharp instruments within the narrow confines of the oral cavity in close proximity to blood, saliva and aerosols exposing them to blood borne pathogens including HIV and the other highly prevalent viruses like Hepatitis B and Hepatitis C which carry a higher transmission risk than HIV.[2] While the average risk of HIV infection after exposure of non-intact skin to infected blood is less than 0.3% [3] the immediate outcome of such an incident results in extreme psychological trauma and may become a life changing event for the unfortunate health care worker who acquires this infection. Of the 504 occupational exposures to potentially infectious material over a 10 year period, in a dental teaching institute, 82.1 percent occurred among dental students who are considered especially vulnerable due to lack of experience and surgical finesse.[4]

The dental team may not be aware of the blood borne pathogen status of a majority of patients who

are being treated in the dental operatory, therefore it is essential for all students, dentists and hospital staff to know and practice universal precautions. In addition there is a need to ensure updated immunization of staff and develop monitoring mechanisms as well as safer instrument handling procedures, safety needles and instruments. [5]

The aim of the present questionnaire based study was to assess the knowledge of BDS students, interns and dentists regarding:

a. HIV /AIDS virus related terminology, modes of transmission, and occupational groups at risk.
b. Workplace related issues including accidental needle prick injury, spillage of infectious material and use of personal protective equipment.
c. Common oral manifestations of HIV / AIDS and anti-retroviral drugs.
d. Opinion about measures for reducing the HIV epidemic in the community.

MATERIALS AND METHODS

The present self-administered, questionnaire based, descriptive study was conducted to assess the knowledge regarding HIV/AIDS from a group of BDS students, interns and dentists at a dental college in north India. The anonymous questionnaire which included open and closed ended questions was developed by the authors to address knowledge regarding HIV/AIDS terminology, transmission modes, population at-risk, prevention, protective wear in the workplace and universal precautions. In addition, specific information regarding common oral lesions, anti-retroviral medication, occupational exposure, post-exposure prophylaxis and accidental spills was sought. The questionnaire is depicted in Table 1.

The questionnaires were distributed to 180 undergraduate BDS students, interns and dental surgeons at the dental college who volunteered to complete it. The data was entered into an Excel worksheet. The open-ended responses of the participants were then categorized into themes and converted into more manageable categories. The data was analyzed using descriptive statistics as numbers and percentages.

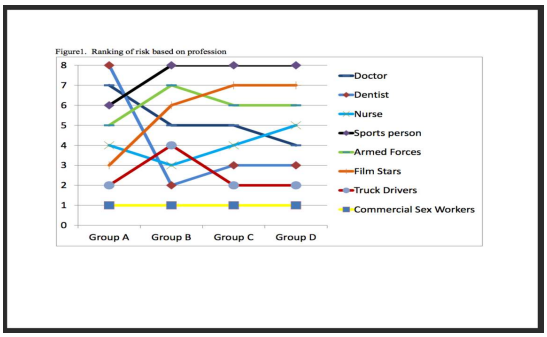
RESULTS

Baseline Data and knowledge in the four groups: Table 2 depicts the questionnaires distributed, response rate, knowledge of what the abbreviations represent, source of initial information regarding HIV / AIDS, nature of virus and modes of transmission.

Ranking of high risk based on profession: (Figure1) the participants were asked to rank various professionals in terms of perceived risk of contracting HIV. All participant groups perceived commercial sex workers at higher risk than other groups. However, while Group A perceived dentists to have lowest risk, Group B ranked them to be the second and Group C as well as D the third highest professionals at risk.

TABLE 1. Baseline data and knowledge in the four groups

Questionnaires distributed	180			
Response Rate : Number (%)	136 (75.5%)			
Groups	**Group A (1st and 2nd BDS)**	**Group B (3rd BDS)**	**Group C (Final BDS)**	**Group D (Interns / Dentists)**
Number (%)	30 (22%)	32 (23.5%)	29 (21.3%)	45 (33%)
Baseline Knowledge				
1. Abbreviations Number (%)				
HIV	18 (60%)	31(96.8%)	26 (89.6%)	39 (86.6%)
AIDS	30 (100%)	32 (100%)	29 (100%)	40 (88.8%)
ELISA	29 (96.6%)	30 (93.7%)	20 (68.9%)	28 (62.2%)
2. Acquisition of initial knowledge regarding HIV / AIDS (number)				
Media sources	25	19	16	33
Friends	2	3	2	5
Teachers	8	11	12	13
3. HIV is RNA virus / DNA virus / Fungus / Protozoa: number, (%)				
RNA Virus	22 (73.3%)	16 (50%)	19 (65.5%)	32 (71.1%)
4. List the mode of transmission of HIV: number, (%)				
Sexual contact	29 (96.6%)	32 (100%)	25(86.2%)	44 (97.7%)
Mother to Child	26 (86.6%)	25 (78.1%)	22 (75.8%)	31(68.8%)
Blood products	25 (83.3%)	28 (87.5%)	25 (86.2%)	40 (88.8%)
Contaminated Needle	23 (76.6%)	27 (84.3%)	24 (82.7%)	35 (77.7%)

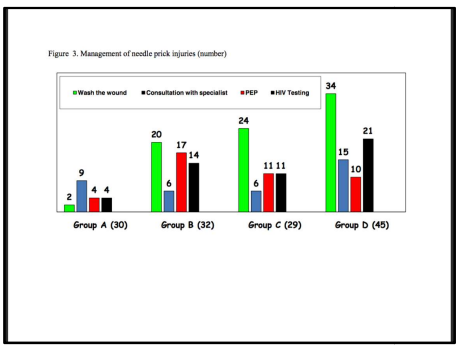


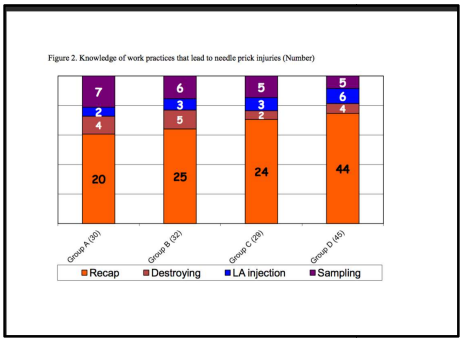
Relative risk of occupational transmission of different viruses: All Group A and a 17 (58.6 percent) of Group C participants perceived HIV was transmitted more easily than Hepatitis B, while 20 (62.5 percent) of Group B and 29 (64.4%) Group D participants indicated that Hepatitis B transmission was easier than HIV.

Knowledge of work practices that lead to needle prick injuries: (Figure 2) The most common reason for needle prick injury was identified to be recapping of needles by majority of participants in all groups.

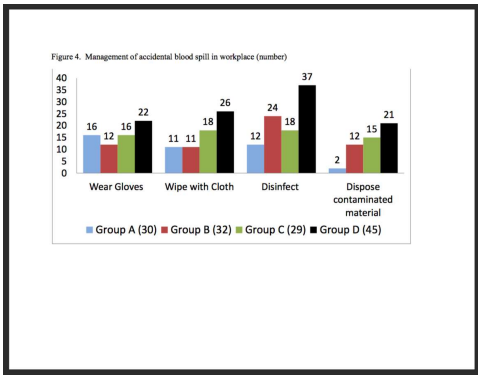
Nature of occupational exposure and ranking of risk: For ranking the occupational exposures in order from most likely to least likely out of the options hollow needle with blood, solid needle with visible blood, needle with no visible blood and splash on intact skin, the correct sequence of ranking was provided by 14 (46.6 percent) in Group A, 14 (43.7 percent) in Group B, 20 (68.9 percent) in Group C and 28 (62.2 percent) in Group D.

Knowledge of Management of Needle Prick Injuries: (Figure 3.) The overall response was not satisfactory with regard to the action to be taken in case of a needle prick incident. A consultation with a medical specialist was considered by less than one-third. The knowledge about post-exposure prophylaxis was acceptable by 53.1 percent in Group B and very low in other groups. Washing of the wound was considered by only 6.6 percent in Group A and by over 60 percent in other groups.

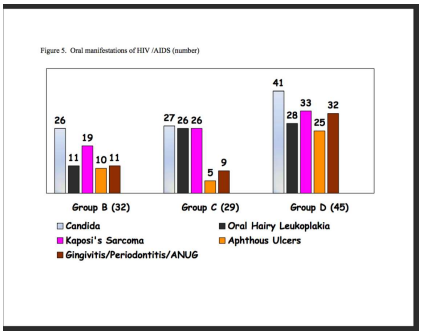




Management of accidental blood spills: (Figure 4) The statements of the respondents were short-listed into use of gloves for handling spills (including not touching with bare hands), wiping the area with cloth or cotton, using disinfectants and disposal of the material and are presented in the figure.



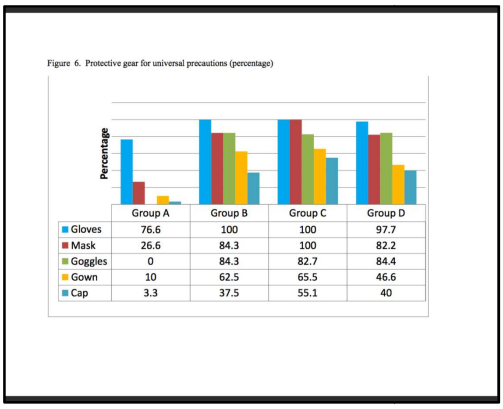
Knowledge of Oral Manifestations of HIV/ AIDS: (Figure 5) The participants were asked to list the oral manifestations of HIV /AIDS. The responses from Group A were unsatisfactory and not analyzed. The majority in the other groups reported mainly Candida infection followed by Kaposi's sarcoma and Oral hairy leukoplakia. Gingivitis, periodontitis, acute necrotizing ulcerative gingivitis and aphthous ulcers were also listed by a low proportion in all groups.



Knowledge of Anti-retroviral drugs: Majority of participants did not know the name of more than

one anti-retroviral drug. The anti-retroviral drug Zidovudine was mentioned by 20 percent to 71.8 percent in different groups. Knowledge that Post Exposure Prophylaxis refers to providing drugs to health care personnel if they are accidentally exposed to HIV contaminated material was known to 30 to 59.3 percent in different groups.

The basis of Universal Precautions that all specimens should be considered as if infected by a blood borne pathogen was known to 26.6 to 64.4 percent in different groups. Knowledge of protective gear while handling HIV patients: (Figure 6) The use of gloves was considered most important by participants in Groups B, C and D, followed by mask, eye protective goggles gowns or aprons and lower for use of caps on the head. In Group A, 76.6 percent considered use of gloves but knowledge of other protective gear was low.



	Group A	Group B	Group C	Group D
Gloves	76.6	100	100	97.7
Mask	26.6	84.3	100	82.2
Goggles	0	84.3	82.7	84.4
Gown	10	62.5	65.5	46.6
Cap	3.3	37.5	55.1	40

Identifying ways to reduce the HIV epidemic: The major themes that emerged from this data through the responses of the participants were needle safety, public awareness, safe sexual practices and blood transfusion safety. Needle safety practices (including disposal, non-reuse, needle-destruction, disposable needles) were identified by over 60 % in Group A, B and C to prevent HIV / AIDS . Among all the groups the importance of public awareness programmes, including school health education was identified by 43.7 to 68.9 percent while the role of safe sexual practices, including having a single partner, was indicated by 62 to 86.2 percent as steps in the direction for reducing the HIV/AIDS epidemic. The role of blood transfusion safety through proper screening was identified by 37.7 to 62.5 percent. The suggestions included counseling during pregnancy in the community and use of universal precautions as well as protective gear in the operatory.

DISCUSSION

The results of the present study indicated that the knowledge of general terminology regarding HIV / AIDS, modes of transmission, recapping and needle prick injuries, and ways to reduce the HIV epidemic was satisfactory. There was some discrepancy in knowledge of the nature of the virus (RNA or DNA), and its transmissibility as compared to hepatitis B which was not as expected. A need to improve knowledge regarding practical problems like management of needle prick incidents, accidental blood spills in the dental operatory, universal precautions and anti-retroviral drugs for Post-exposure prophylaxis was identified.

The present study had a response rate of 75.5 percent. A questionnaire based survey of dental students and interns in Uttar Pradesh, had a response rate of 79.7 percent, similar to the present study while another study from Brazil on occupational exposure to potentially infectious material among final year dental undergraduates had a higher rate of 86.4 percent. [6],[7]

Studies regarding knowledge of HIV/AIDS among dental students have observed overall mean knowledge on this subject to be excellent or good.[6],[8] In a low prevalence country, Iran, the medical students' knowledge of HIV/AIDS was good in 27.1 percent while for their dental counterparts it was 10.5 percent. [9] In a questionnaire based study on dental practitioners, 70.5 percent identified the T lymphocyte as the host cell affected in AIDS and that intact skin contact with blood of HIV patient did not result in infection indicating good knowledge of basics of the disease. [10]

In a majority of studies related to this subject, students and dentists identified Oral Candidiasis, Kaposi's sarcoma, ANUG, oral hairy leukoplakia, major aphthous ulcers as the most common oral manifestations. [6], [8],[10] The results are similar to the Group B, C and D in the present study except that the Group A participants did not provide any correct responses to this question.

Where participants reported 35.6 percent percutaneous and mucous membrane exposures to potentially infectious material, incomplete use of the full complement of individual protective equipment including gloves, cap, mask, coat, protection glasses and closed shoes was implicated. While the present study did not evaluate incidents of actual clinical exposure to infectious material, a majority considered use of gloves, mask and eye protection, but only a few considered the use of gown and cap. The Group A, however, had deficient knowledge of protective gear.[7]

In a high prevalence setting, while a majority (89 percent) had knowledge of PEP and an increasing trend observed with years of education, 43.5 percent knew that it should be started within one hour after needle prick, 26.6 percent knew the latest expanded three-drug regime used in PEP and 35.1 percent could report the duration for which PEP should be given. [11]

Dental students adequacy of knowledge of blood borne pathogens (66.7 percent), identifying that Hepatitis C was more transmissible than HIV (84.9 percent) and that a non- hollow bore needle without visible blood constituted a low risk was offset by low (25 percent) overall knowledge of post-exposure management with only 44.2 percent indicating the immediate steps to wash thoroughly with soap and water and 46.5 percent on timing of Post Exposure Prophylaxis. The pre-clinical students answered fewer questions on transmission and management of exposures in the workplace.[12]

In an evaluation of Hepatitis B viral infection control and practice measures among dental students, a relatively good knowledge was accompanied with less than satisfactory response to practical issues. Significantly, 11-30 percent were knowledgeable about standard universal precautions. 45.8 percent of the participants had sustained needle stick injuries, mostly in the earlier academic years, a majority recapping needles as a matter of routine, but creditably 68.3 percent of them using single hand recapping technique. [13]

Electronic (16.1 percent) and print media (13.1 percent) were identified by dental students as sources of knowledge regarding HIV/AIDS in addition to internet (18.6 percent) and textbooks (17.2 percent). The majority considered alcohol (40.6 percent) over sodium hypochlorite (29 percent) in the management of blood spills on environmental surfaces. Another study identified differences in responses of students from public and private dental institutions regarding HIV / AIDS but in general media, reading sources, lectures, health care workers were sources of information, unsafe blood transfusion a major risk factor and health workers, barbers, soldiers and truck drivers were high risk groups. [14] [15]

The present study has certain shortcomings. The authors used a self-developed questionnaire which was not pre-validated. The majority of studies cited above have used a validated and pre-tested questionnaire. The number of participants in each group was also low and meaningful statistical data could not be derived. There were deficient responses to some questions in all groups so meaningful information could not be extracted. For example, the abbreviation CD4 did not elicit a good response from all groups and Group A did not provide any information on oral manifestations of HIV/AIDS. The questionnaire did not cover other aspects like actual needle prick incidents and hepatitis B immunization status which would have increased our knowledge regarding this population. There may have been some reporting bias as the participants provided the information on a voluntary basis and whether they had shared responses among themselves cannot be ruled out. However, the authors are of the opinion that the strength of open-ended questions reduces cueing and encourages the participant to synthesize knowledge into meaningful information.

CONCLUSION

The present study has given an insight into the knowledge of students and dentists regarding HIV / AIDS which adds to the existing literature independently. In order to provide high quality care to the vulnerable population having multiple blood borne pathogens including HIV /AIDS without fear of adversely affecting the dental workers and the environment requires regular training on theoretical and practical aspects of universal precautions, effective immunization against hepatitis B and early identification and referral of health care workers exposed to blood borne pathogens.

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Case Report

SURGICAL EXPOSURE OF A UNILATERAL IMPACTED MANDIBULAR CANINE FOLLOWED BY ORTHODONTIC EXTRUSION: A CASE REPORT.

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ABSTRACT

Impacted teeth are those with a delayed eruption time or that are not expected to erupt completely based on clinical and radiographic assessment. Impaction of the permanent third molar teeth is a common clinical occurrence. There are several etiologic factors for canine impactions have been proposed - primary reasons are long path of eruption and genetic influence. The maxillary canine is developing high into the palate with a tortuous course of its eruption path and the mandibular canine is also developing at the lower border of the mandible which might lead to its impaction. In the case presented here, we performed surgical exposure of the impacted canine followed by orthodontic extrusion of the same to its proper alignment in the arch. A 10 -year-old female child came to the Department of Pedodontics for routine dental check-up. On intra - oral examination, the mandibular left lateral incisor was found rotated and there was spacing between the central incisor and lateral incisor. On radiographic examination it was revealed that there was ectopic eruption of the lower left permanent canine with its crown almost overlapping the root of the lateral incisor of same side. The management of impacted canines is important in terms of aesthetics and function. Clinicians must formulate treatment plans that are in the best interest of the patient and they must be knowledgeable about the variety of treatment options.

Key words: Impacted canine, ectopic eruption

INTRODUCTION

Impacted teeth are those with a delayed eruption time or that are not expected to erupt completely based on clinical and radiographic assessment[1]. Impaction of the permanent third molar teeth is a common clinical occurrence. All teeth can be impacted, however, third molars, maxillary canines, mandibular second premolars and maxillary central incisors are the teeth most frequently involved[2]. The prevalence of impacted third molars are 16.7% -68.6% and maxillary canines impaction is 0.9 - 2.2% ***[D'Amico et al., 2003; Aydin et al., 2004; Rohrer, 1929]***[3-5]. The impaction of the mandibular canine is less frequent, and the prevalence of impacted mandibular permanent canines ranges only 0.05-0.4% ***[Mead, 1930; Yavuz et al., 2007; Sham et al., 1978; Brown et al., 1982]***[6-9]. In this case-report we described a rare condition of impacted mandibular canine of a child in the mixed dentition period.

There are several etiologic factors for canine impactions have been proposed - primary reasons are long path of eruption andgenetic influence[10]. The maxillary canine is developing high into the palate with a tortuous course of its eruption path and the mandibular canine is also developing at the lower border of the mandible which might lead to its impaction. The genetic influence of canine impaction was studied by various authors and found genetic involvement in canine impaction. However, females are found to be more affected with canine impaction? (Because x chromosome is involved). In cases of cleft lip and palate, the maxillary canine tends to erupt through the cleft or it may get impacted. The supernumerary tooth or tooth fragments of primary tooth may also cause impaction of permanent canine although supernumerary teeth mostly cause impaction of permanent incisors. Ectopic eruption path and thick palatal mucosa can contribute to impaction of maxillary canine. Endocrinologic deficiency may also be a contruting factor in some cases with canine impaction but it is also more likely to cause generalized impaction or delayed eruption of all the teeth[11].

The other factors are the arch length tooth size discrepancy where jaw size is smaller than the tooth material may cause impaction of canine. In cases of absence of maxillary lateral incisor, {due to congenital missing tooth} there is loss of guidance for the canine [12-14]. If there is retained primary canine or premature loss of primary canine will also cause impaction of permanent canine. Trauma to the primary canine may sometimes

cause dilaceration of the permanent canine leading to impaction[15,16].

Although usually asymptomatic, the situation represents functional, aesthetics, orthodontics and surgical problems. After diagnosis, four types of stances are possible, facing impaction or missing eruption of teeth: abstention (mandibular canines close to the alveolar nerve); extraction; etiologic therapy if a deciduous tooth blocks the evolution; surgical exposure[17].

In the case presented here, we performed surgical exposure of the impacted canine followed by orthodontic extrusion of the same to its proper alignment in the arch.

CASE REPORT

A 10 -year-old female child came to the Department of Pedodontics for routine dental check-up. On intra - oral examination, the mandibular left lateral incisor was found rotated and there was spacing between the central incisor and lateral incisor. On radiographic examination it was revealed that there was ectopic eruption of the lower left permanent canine with its crown almost overlapping the root of the lateral incisor of same side (Fig-1).

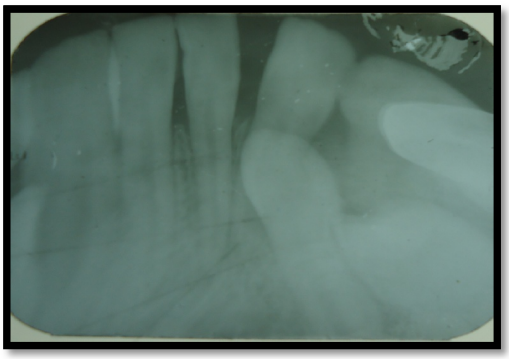

Figure 1: Preoperative IOPA showing ectopically erupting canine on lower left side

More than two third of the root formation has been completed and there is less possibility for the tooth to erupt on its own. So we had planned to expose the tooth surgically followed by orthodontic extrusion. An OPG was taken for the record purpose (Fig-2). The goals of treatment for the patient were to expose the impacted mandibular left canine and then bring it into the dental arch, to level and align the dental arches.

Figure 2: Preoperative Orthopantomogram showing the ectopically erupting canine on lower left side

Both lower first permanent molars were banded & brackets were placed on right mandibular primary canine, permanent lateral and central incisor, left mandibular permanent central and lateral incisor (Fig-3).

Figure 3: Photograph after bracket placement

One week later surgical exposure of the impacted canine was planned and under aseptic conditions. Left inferior alveolar nerve block was administered using 2% Lignocaine with adrenaline. The impacted mandibular left canine was exposed surgically and the muco-periosteal flap was reflected just enough to expose the crown of the tooth (Fig-4). The exposed crown of impacted canine was etched, bonded and a orthodontic bracket was placed under proper isolation (Fig-4). After this procedure, extraction of retained primary lower left canine (73) was done followed by suture placement. Post-surgical instructions were given and necessary antibiotics and analgesics were prescribed. Patient was recalled after a week for suture removal.

Figure 4: Photograph showing the impacted ectopically erupting canine after flap reflection

An uneventful healing was observed at recall visit and sutures were removed ater 7 days. Orthodontic force was applied immediately by ligating the bracket with 0.009 ligature wire to 0.016 round Ni-

Ti to pull the canine. Then, to move the crown of the canine away from the apex of the root of the lateral incisor, distal and upward traction was applied to the canine, using an elastic chain hooked from the bracket on the canine to the buccal tube of the left molar band (Fig-5).

Figure 5: Photograph showing orthodontic extrusion of impacted canine

Over the next 6 months, the progress of canine eruption was evaluated monthly. No complications were observed at the surgical site, and the gingiva remained healthy. Once sufficiently erupted, the crown of the impacted canine was rebonded with a canine bracket to finish the occlusion. (Fig-6)

Figure 5: Photograph showing post-operative view after six months follow up

DISCUSSION

Canines are important for an attractive smile as it is the cornerstones of the dental arch and are also essential for a functional occlusion. Therefore, extraction of the impacted permanent canine is generally contraindicated. The diagnosis and localization of the impacted teeth is the most important step in the management of impacted teeth. However, bringing an unerupted or impacted permanent canine into the occlusion should not be the only goal in managing these teeth. The aim should be to attain proper occlusion, with a healthy zone of attached gingiva and ideal alveolar bone height.

Failure of eruption of the mandibular canine is an unusual event[18]. Mandibular canine impaction is regarded as a much rarer phenomenon and there are limited numbers of studies revealing its frequency of occurrence[4]. ***Grover and Lorton***[19] found only 11 impacted canines (0.22%) in the mandible in 5000 individuals. ***Chu et al.***[20] reported five mandibular impacted canine (0.07%) teeth in 7486 patients. A study by ***Rohrer***[5] examining 3,000 patients radiographically found 62 impacted maxillary canines (2.06%) and only three impacted mandibular canines (0.1%),in a 20:1 ratio. In another study by ***Aydin et al***[4] involving 4500 Turkish patients, the incidence of mandibular canine impaction was 0.44%. Definitely, maxillary canine impaction is more frequent than is mandibular canine impaction[3,4,21].

There are many reasons for the failure of tooth eruption, including inadequate space, supernumerary teeth, premature loss of deciduous teeth, retention of deciduous teeth, excessive crown length, hereditary factors, functional disturbance of endocrine glands, tumors, cysts, and trauma [22-27]. However, our patient had no apparent tumors, cysts, and dental trauma. Therefore, in this present case, we believed that the origin of the canine impaction was due to the ectopic eruption of lower left permanent canine.

The mandibular canines are affected by pathology in a lower ratio than the third molars and premolars[18,20]. However, some authors reported few cases of dentigerous cyst, squamous odontogenic tumors, and ameloblastoma which were associated with impacted mandibular canine teeth[26,27,28]. But in our case no such pathologies were observed.

Most impacted teeth are asymptomatic, but chronic infection with fistula formation and some symptoms such as pain and swelling have been reported in the literature[18,20]. In our case the tooth was completely asymptomatic.

There are several treatment options proposed for impacted mandibular canines including surgical removal, exposure and orthodontic alignment, transplantation, and observation[29]. If adequate space for alignment of an impacted mandibular canine exists and it is mechanically possible to reposition an impacted mandibular canine into proper position, then orthodontic treatment is indicated[29,30]. Following surgical exposure, the impacted tooth may be allowed to erupt passively, especially if it has a favourable angulation to erupt on its own. Alternatively, forced eruption may be carried out in conjunction with orthodontic alignment[30,31].As a third alternative, if an impacted canine cannot be positioned favourably but there is space for its full eruption, then orthodontic treatment may help to align the adjacent teeth in their migrated order followed by crowning or recontouring of some teeth to improve esthetics[32].

Orthodontic treatment is associated with soft and hard tissue changes, thus creation and maintenance

of gingival and periodontal health is paramount to ensure optimal results. Although no specific dimensions of keratinized tissue have been indicated for maintenance of periodontal health, in orthodontic cases presence of keratinized tissue is important to prevent formation of periodontal defect[33,34]. Classically, three fundamental principles are considered when treating impacted teeth: the surgical approach, the type of fixation that is adhered to the tooth for its posterior traction and the orthodontic movements that have to be applied in order to position the tooth in the dental arch[35,36,37].From a periodontal perspective, the appropriate surgical technique should allow the orthodontist to apply measured forces in a favourable direction for efficient correction of the impaction and for avoidance of damage to adjoining soft tissues and teeth [33,34,35,38].

The orthodontic guidance of impacted canine may not be successful in all the cases; there may be failures, nonalignment of impacted canine in the desired position. The prognosis is worst in cases where canine is impacted horizontally and apically deep in palatal process[39]. The other factors known for failure include ankylosis of impacted canine, malformations of root, external resorption. Root resorption is reported to be more frequently in palatally impacted canine. An unexplained pain can be because of collision of crown of impacted canine with roots of adjacent teeth. If the impacted canine does not respond to the applied orthodontic force for 3 months, supplementary treatment plan has to be carried out[40].

CONCLUSION

The management of impacted canines is important in terms of aesthetics and function. Clinicians must formulate treatment plans that are in the best interest of the patient and they must be knowledgeable about the variety of treatment options. When patients are evaluated and treated properly, clinicians can reduce the frequency of ectopic eruption and subsequent impaction of the maxillary canine.

Various surgical and orthodontic techniques may be used to recover impacted canines[41]. The proper management of these teeth, however, requires that the appropriate surgical technique be used and the clinician must be able to apply measured forces in a favourable direction. This allows for complete control in efficient correction the impaction and for avoidance of damage to adjacent teeth. Careful selection of surgical and orthodontic techniques is essential for the successful alignment of impacted canines.

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Case Report

Dental twinning in Primary Dentition: A Case report

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ABSTRACT

Odontogenic anomalies can occur as a result of conjoining or twinning defects. These include fusion, gemination and concrescence. The process of odontogenesis cannot be seen, therefore fusion and germination seems to be equivalent. This case report is of a boy aged-5-year who visited private dental clinic with a complaint of decayed upper front teeth. On clinical examination, the patient was diagnosed with ECC (Early childhood caries) and presence of fusion between primary upper left central incisor (61) and a supernumerary tooth. Radiographic analysis showed presence of a two roots with two root canals and external root resorption. The case was discussed and treatment planning was done to extract the tooth as a result of resorption in the apical region. The purpose of this report is to highlight the importance of diagnosing dental anomalies in the primary dentition, so as to organize a conservative individualized treatment plan to prevent complications during the child's formative years.

Key words: Primary double teeth, Fusion, Germination, Primary teeth.

INTRODUCTION

The occurrence of dental abnormalities can be in the number, morphology, or eruption pattern of the teeth affecting both the primary and permanent dentition.[1] The terms 'double teeth', 'double formations', 'conjoined teeth' [2-6] 'fused teeth'[7,8] or 'dental twinning' [9] are often used to describe fusion or gemination, both of which are primary developmental abnormalities of the teeth. However, literature shows that the differential diagnosis between fusion and gemination is difficult (in some cases, fusion with supernumerary tooth).The term "double teeth" is often used to describe both anomalies. [10] Traditionally, the terminology classifies fusion as a union of two separately developing tooth germs typically leading to one less tooth than normal in the affected arch. Whereas, Gemination occurs due to incomplete division of two teeth, resulting in a larger bifid crown structure with single root and single canal. The etiology of fusion may be due to some physical force or pressure produces contact of the developing teeth and subsequent fusion, depending upon the stage of development at the time of fusion, the union may be total or partial and may occur between a two adjacent teeth or between a normal and supernumerary tooth. [11] Clinically, in Gemination there is normal number of teeth in the dental arch but in the later there is one less than the normal teeth count however if the fusion is between normal and supernumerary tooth the teeth count remains normal(as in this case report). The prevalence of double teeth varies between 0.1 and 3% more commonly seen in mangoloids than caucasians affecting primary dentition than permanent, frequent in the maxilla than in the mandible, occurs mostly unilateral rarely bilateral. Although, cases have been reported in the posterior region, incisors (majority of the cases lateral incisors are affected) and canines are more susceptible. [12,13]

This article presents a case report of Con-joined primary central incisor and supernumerary tooth with Early Childhood Caries in a 5-year-old boy. Although there is extensive literature on fused and geminated teeth which affects the normal dentition, this report presents a rare case of fusion between a supernumerary tooth and the primary central incisor tooth.

CASE REPORT

A 5-year-old boy accompanied by his parents reported to a private dental clinic at Bangalore, India, with a chief complaint of decayed and discolored upper front teeth. The parents also had noticed that one of the upper front teeth was larger than the adjacent tooth. The parents informed a history of pain 3 months before and the pain subsided with antibiotics and analgesics. The parents also informed that none of the family members had any dental anomalies and the patient had no relevant medical history. Oral examination of the child revealed presence of all twenty primary teeth and was diagnosed with early childhood caries (ECC). The upper left primary incisor (61) was fused with a supernumerary tooth resulting in Double teeth. This tooth was affected with caries in the labial groove and showed grade II mobility. The mesio-distal width of 61 was greater than 51 and normal count of teeth suggested that the tooth 61 was fused with a supernumerary tooth. (Figure

1)

Figure 1: Intraoral Frontal view of a patient showing primary double teeth irt 61(fusion between central incisor and supernumerary tooth)

Radiographic evaluation of this double tooth revealed two root canals within a single root and external root resorption due to periapical infection. The permanent successor was present and was not affected by this anomaly. The radiograph also showed grossly destructed crown of 51 and 52 with pulpal involvement. (Figure 2)

After clinical and radiographic evaluation the patient was diagnosed with ECC with Double teeth (51). The parents were informed about the double teeth and treatment plan for the child which included oral prophylaxis, stainless steel crown for 54, pulp therapy followed by composite strip crown for 51, 52 and extraction of double teeth followed by fixed anterior space-maintainer. After dental extraction of 61 under local anesthesia the parents were given appointment for further dental treatment but the patient did not turn up for the appointment.

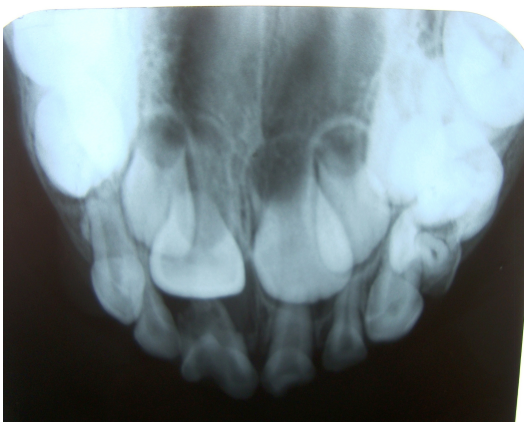

Figure 2: Occlusal radiograph showing double teeth with two roots and two canals with extensive root resorption.

The extracted specimen of 61 shows external resorption and completely fused teeth. (Figure 3)

Figure 3: Extracted primary double teeth.

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DISCUSSION

The factors which have been implicated as possible etiologies for fused teeth include thalidomide ingestion, hypervitaminosis, pressure from physical contact of young tooth buds, and genetic factors. [14] A genetic etiology also has been suggested for the development of supernumerary teeth, localized disturbances in odontogenesis, and extensions of, or epithelial remnants from, the dental lamina. [15,16]

Each Double Teeth was classified according to Aguilo et al. [1999], as

Type I: bifid crown, single root. A large crown with a notch on the incisal edge and a bifid pulp chamber, with normal dimensions of the root and radicular canal and cervical widening.

Type II: large crown, large root. A large crown, usually lacking a groove or notch, with single, shared, large root canal and pulp chamber and a wider than normal root.

Type III: two fused crowns, double conical root. Two fused crowns with a partial or total vertical groove extending cervically; the crowns may be symmetrical or show distinct differences, and the pulp chambers may be separate. One large conical root. The coronal and radicular portions of the pulp canal may be fused, or the coronal portion may be shared and end in two radicular canals.

Type IV: two fused crowns, two fused roots. Two crowns (as in type III) and two distinct, joined roots with separate root canals. Studies have shown that type IV DOUBLE TEETH most frequently, followed in order by types II, I, and III. Type I was found only in the maxilla, types II and III were found only in the mandible, and type IV was most frequently seen in the maxilla. [10] The present case also showed type IV Double Teeth.

Double Teeth is of interest because it is related to aesthetic and functional problems, such as ECC, delayed exfoliation due to difference in the resorption timing of the roots, and anomalies in the permanent dentition such as impaction of the successors, supernumerary teeth , permanent double teeth or aplasia of teeth. [11] Management of such teeth includes observation and allowance of normal exfoliation when a communication for bacterial access to the pulp chambers does not exist, endodontic therapy, restoration, separation with restoration, or extraction. [14] The above case suggested that presence of labial groove in the double teeth would have a synergistic effect on the occurrence of ECC. Thus, dental anomalies in the primary dentition should be diagnosed early to avoid ECC. The problem associated with treatment plan is the difference in the resorption timing of the fused teeth. Hence, the case of fusion needs to be carefully evaluated and treatment should be planned. In this case extraction was considered as the treatment of choice due to extensive external root resorption in 61 which would inturn allow for the normal eruption of the succedaneous tooth.

CONCLUSION

Fusion and Gemination are not usual conditions, but they are important dental anomalies. The anomalies of Permanent dentition are strongly associated with anomalies in the Primary dentition. Therefore recognizing the condition at the earliest by careful clinical and radiographic observations will facilitate the establishment of a right treatment at appropriate time with multidisciplinary view for better prognosis.

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1. Personal author(s): Parija SC. Textbook of Medical Parasitology. 3rd ed. All India Publishers and Distributors. 2008.
2. Editor(s), compiler(s) as author: Garcia LS, Filarial Nematodes In: Garcia LS (editor) Diagnostic Medical Parasitology ASM press Washington DC 2007: pp 319-356.
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Electronic Sources as reference

Journal article on the Internet: Parija SC, Khairnar K. Detection of excretory *Entamoeba histolytica* DNA in the urine, and detection of *E. histolytica* DNA and lectin antigen in the liver abscess pus for the diagnosis of amoebic liver abscess .*BMC Microbiology* 2007, **7:**41.doi:10.1186/1471-2180-7-41. http://www.biomedcentral.com/1471-2180/7/41

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