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To Determine the Prevalence of Cysts and Tumors in Dental College

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Abstract

This study aimed to ascertain the prevalence of cysts and tumors among patients attending a dental college. Utilizing retrospective data analysis, a significant sample size was examined. Findings reveal critical insights into occurrence rates, contributing to improved diagnostic and therapeutic strategies within the dental community.

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1. INTRODUCTION

Cysts and tumors are a diverse group of lesions originating from the tissue remnants of the tooth forming apparatus or due to inflammation.[1,2] A cyst is defined as a "pathological cavity having fluid, semi fluid or gaseous contents and which is not created by the accumulation of pus". Most cysts but not all are lined by epithelium.[3] Odontogenic cysts have been classified based on origin as inflammatory and developmental. These cysts are unique in that they only affect the maxillofacial region, arise from the embryological remnants of dental organ and have typical histopathological features.[4] Odontogenic tumors comprise a heterogeneous group of lesions that develop on the gnathic bones that ranges from hamartomas to benign and malignant neoplasms of variable aggressiveness. They are classified as epithelial, ecto-mesenchymal, and mesenchymal tumors, among which the most frequent odontogenic tumors are ameloblastomas, and odontomas.[5,6] It has been reported that Odontogenic tumors(OT) have a predilection for the entire facial region specifically, for the mandible and maxila.[7] The treatment of choice for OT is surgical operation; extirpation and curettage for benign type, and segmental resection for malignant type of OT. If left untreated, it could result in death within four to six months of diagnosis.[8] The present study was conducted to determine the prevalence of odontogenic cysts and tumors in a rural area.

In the realm of Pediatric Dentistry, the advent of Artificial Intelligence signals a transformative shift with profound implications. At its core, AI encompasses machine learning, computer vision, natural language processing, and other computational technologies that enable machines to mimic cognitive functions associated with human intelligence.[1,2] Its integration into pediatric dental practice offers a wide array of benefits, aiming to enhance both the quality and efficacy of dental care provided to children. One of the most salient applications is in the accurate analysis of dental imaging.[3,4]Advanced AI algorithms can tirelessly scrutinize dental radiographs and other imaging modalities, detecting pathologies such as carious lesions and developmental anomalies with a level of precision that complements—and in some cases, surpasses—the discerning eyes of experienced clinicians. Furthermore, these intelligent systems are imperative in the early identification of orthodontic irregularities, potentially minimizing or circumventing the need for more invasive corrective procedures as a child grows.[5,6]

This technology is also instrumental in preventive care, wherein AI's predictive prowess helps to forecast imminent dental issues based on historical data and risk factors unique to pediatric populations. Such anticipatory guidance empowers

dentists to tailor preventive strategies to each child's specific needs, potentially curtailing the progression of dental diseases. In terms of treatment, AI is revolutionizing the customization of dental care by facilitating the design of patient-specific dental appliances and devising more precise treatment plans using AI-augmented simulations.[1,2]

The introduction of AI into Pediatric Dentistry is not about replacing the human touch that is so essential in caring for children. Rather, it presents a symbiotic toolset designed to support and elevate pediatric dental professionals, enabling them to focus more on the nuanced and empathetic aspects of patient care while entrusting certain clinical and educational tasks to their intelligent machine counterparts. As the technology matures, the promise of AI in Pediatric Dentistry is not just to streamline processes and improve outcomes but also to redefine the very nature of pediatric dental care, making it more personalized, accessible, and less intimidating for our youngest patients.[1,2]

2. MATERIAL AND METHOD

The present study was conducted to determine the prevalence of odontogenic cysts and tumors. The subject belonged to Mithila Minority Dental College and Hospital, Darbhanga, Bihar, India. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute. Cases included in the study were diagnosed as odontogenic cysts and tumors retrospectively over the period of two years. Data regarding gender, location were gathered from the clinical records, case notes and follow-up records in the files along with biopsy reports. Classification of the diagnosis was based on the International Statistical Classification of Diseases and Related Health Problems (ICD-10) published by World Health Organization. Data was analyzed using the SPSS — 20 (Chicago, IL-USA)) statistical software for Windows. Descriptive statistics and test of significance were appropriately applied and used. The critical level of significance was set at $P < 0.05$.

3. RESULT

Among the clinical records of 220 maxillofacial cases retrieved retrospectively over a period of two years, only 125 confirmed cases of odontogenic cysts and tumors were detected. Odontogenic cysts were 76.8% and odontogenic tumors were 23.2%. Radicular cysts were prevalent in the study. Dentigerous cysts were 29 in no. and OKC were 13 in no. In men cysts were prevalent than women. Radicular cysts were 29 in no. in men and 22 in women. Calcifying odontogenic cysts and glandular odontogenic cysts were present only in males. OKC, OOC, Dentigerous cyst, Calcifying odontogenic cyst was present maximum in posterior mandible. Radicular

cyst was maximum in anterior maxilla. Glandular odontogenic cyst was present in posterior maxilla. Unicystic Ameloblastoma was maximum in no. in the study. Ameloblastoma, Unicystic ameloblastoma, Plexiform unicystic ameloblastoma was maximum in males. Adenomatoid odontogenic tumor, Odontoma was present in females. Ameloblastoma, Unicystic ameloblastoma, Odontoma was maximum in posterior mandible. Adenomatoid odontogenic tumor was equally present in anterior maxilla and posterior maxilla. Plexiform unicystic ameloblastoma was present in anterior mandible.

Table 1: Distribution of Cysts and tumors among a sample

Variable	N (%)
odontogenic cysts	96 (76.8%)
odontogenic tumors	29 (23.2%)
Total	125 (100%)

4. DISCUSSION

Among the clinical records of 220 maxillofacial cases retrieved retrospectively over a period of two years, only 125 confirmed cases of odontogenic cysts and tumors were detected. Odontogenic cysts were 76.8% and odontogenic tumors were 23.2%. Radicular cysts were prevalent in the study. Dentigerous cysts were 29 in no. and OKC were 13 in no. In men cysts were prevalent than women. Radicular cysts were 29 in no. in men and 22 in women. Calcifying odontogenic cysts and glandular odontogenic cysts were present only in males. OKC, OOC, Dentigerous cyst, Calcifying odontogenic cyst was present maximum in posterior mandible. Radicular cyst was maximum in anterior maxilla. Glandular odontogenic cyst was present in posterior maxilla. Unicystic Ameloblastoma was maximum in no. in the study. Ameloblastoma, Unicystic ameloblastoma, Plexiform unicystic ameloblastoma was maximum in males. Adenomatoid odontogenic tumor, Odontoma was present in females. Ameloblastoma, Unicysticameloblastoma , Odontoma was maximum in posterior mandible. Adenomatoid odontogenic tumor was equally present in anterior maxilla and posterior maxilla. Plexiform unicystic ameloblastoma was present in anterior mandible. In one study conducted in France by Meningaud et al., the files of patients operated upon under general anesthesia for odontogenic cysts were analyzed. It has been shown that the mean age of the patients was 41.8 ± 15.8 years. The lesions were more common in the mandible than in the maxilla (in a mandible to maxilla ratio of 3:1) with male predominance. The most frequently diagnosed

odontogenic cysts found were radicular cysts (53.5%), dentigerous cysts (22.3%) and odontogenic keratocysts (19.1%).[8] Radicular cyst also known as periapical cyst is the most common inflammatory cyst that results from epithelial proliferation within an inflammatory focus, due to dental caries resulting in pulpal infection leading to death and necrosis of the pulp.[9] Radicular cyst accounted for 56.9% and 60.3% of all cysts, occurring more frequently in the anterior maxilla in the study done by Koseoglu et al.[10] and Jones et al.[11] respectively. Some studies in North America[12] and Asia[13] showed a higher incidence of these tumors in females. Mandible was the main anatomical location with a mandible: maxilla ratio of approximately 2.8:1.[14]

5. CONCLUSION

The present study concluded that there was a higher incidence of odontogenic cyst than odontogenic tumors, with a malepredilection, posterior mandible being the most common site.

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