

## Original Article

### Assessment of interleukin- 6 level in children with Dental Caries

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#### ABSTRACT:

**Background:** Dental caries is a process that may take place on any tooth surface in the oral cavity. The present study was conducted to assess interleukin- 6 level in children with dental caries. **Materials & Methods:** The present study was conducted on 162 patients of age ranged 3-8 years with dental caries of both genders. Saliva sample collection and saliva was collected in sterile Eppendorf tubes. Salivary IL-6 assessment was done using the Salimetrics ELISA kit. **Results:** We found that age group 3-4 years had 24 patients, 4-5 years had 54, 5-6 years had 46, 6-7 years had 26 and 7-8 years had 12. Mean IL- 6 level in boys was 94.2 and in girls was 96.4. **Conclusion:** Authors concluded that there was high level of IL- 6 in children with dental caries.

**Key words:** Children, Dental caries, interleukin- 6

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#### INTRODUCTION

Dental caries is a process that may take place on any tooth surface in the oral cavity where dental plaque is allowed to develop over a period of time. Dental caries and obesity are multifactorial diseases related to poor eating habits and show a close relationship with the sociodemographic characteristics of individuals presenting these diseases.<sup>1</sup>

Children who are frequently exposed to sugary liquids, breast milk, formula, fruit juices, and other sweet liquids for long periods run at a great risk of suffering from early childhood caries (ECC). The American Academy of Pediatric Dentistry (AAPD) defines ECC as the presence of one or more decayed teeth, missing teeth (resulting from caries), or filled tooth surfaces in any primary tooth in a child of 6 years or younger.<sup>2</sup>

Most children with ECC have a complaint of pain indicating bacterial involvement of the dental pulp. There is a cytokine cascade that is induced in response to bacterial infection of the dental pulp which includes interleukin-1 (IL-1), IL-6, IL-8, IL-10, IL-12, and tumor necrosis factor-alpha (TNF- $\alpha$ ). Cytokines play a major role in the

inflammatory and immune responses.<sup>3</sup> IL-6 has both pro-inflammatory and anti-inflammatory properties, and understanding its possible role as a marker for dental caries will prove very useful, especially while dealing with children with ECC. These pro-inflammatory cytokines play a regulatory role in cardiac remodeling and possess strong cardiac depressant properties. It is possible that a chronic bacterial infection like ECC can induce an upregulation of pro-inflammatory cytokines which may be very much aggravated in patients having an underlying cardiac disease.<sup>4</sup> The present study was conducted to assess interleukin- 6 level in children with dental caries.

#### MATERIALS & METHODS

The present study was conducted in the department of Pedodontics. It comprised of 162 patients of age ranged 3-8 years with dental caries of both genders. All parents were informed regarding the study and written consent was obtained. Ethical approval was obtained from institute prior to the study.

General information such as name, age, gender etc. was recorded. A careful intraoral examination was carried out prior to the commencement of the study. Patients were asked to refrain from eating 60 min before saliva sample collection and saliva was collected in sterile Eppendorf tubes using disposable plastic pipettes. Samples were then

immediately stored at a low temperature of 4°C and transported to a laboratory within 2 h. Salivary IL-6 assessment was done using the Salimetrics ELISA kit. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Age wise distribution of patients**

Age group (Years)	Number of patients
3-4	24
4-5	54
5-6	46
6-7	26
7-8	12

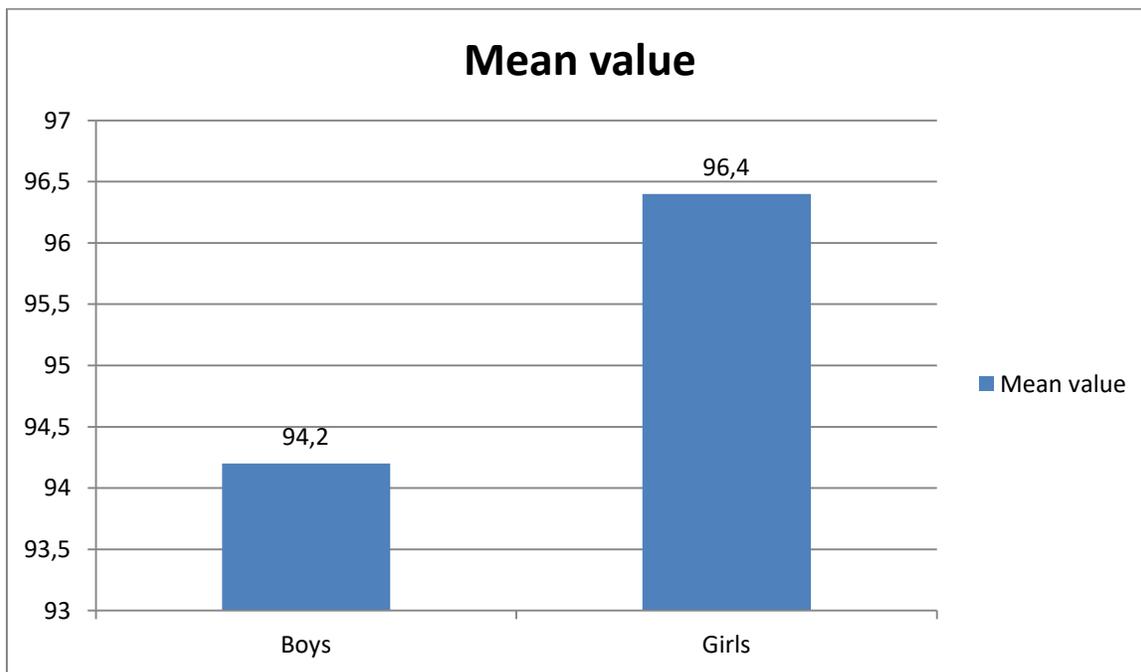
Table I shows that age group 3-4 years had 24 patients, 4-5 years had 54, 5-6 years had 46, 6-7 years had 26 and 7-8 years had 12.

**Table II Assessment of IL- 6 level**

Total patients	Mean value boys	Mean value Girls
162	94.2	96.4

Table II, graph I shows that mean IL- 6 level in boys was 94.2 and in girls was 96.4.

**Graph I Assessment of IL- 6 level**



## DISCUSSION

Dental caries is an important dental public health problem and is the most prevalent chronic disease of the childhood. Caries in primary dentition is known to be a sign of high risk of caries in permanent dentition; it is therefore important to identify those children affected with caries.<sup>5</sup> It has been reported that caries distribution follows a typical pattern in the primary dentition. The pattern of dental caries varies not only with age, sex, race, feeding habits, oral hygiene practices, geographical location, and socioeconomic status but also within the oral cavity. All the teeth and all the surfaces are not equally susceptible to caries. It is therefore important to know the relative caries susceptibility of the teeth in the maxillary and the mandibular arch. There is not much data about the association of pattern of early dental caries with the caries progression in preschool children.<sup>6</sup> Specific and distinct patterns of caries attack might indicate a distinct etiology or are most likely associated with the subsequent development of carious lesions on other surfaces of teeth. Hence, a detailed knowledge of caries patterns is important. In a population with permanent dentition, the dental caries status is traditionally described using mean values of decayed, missing, and filled teeth or surfaces (DMFT or DMFS). This index requires recording the condition of every tooth or tooth surface in the dentition.<sup>7</sup> The present study was conducted to assess interleukin- 6 level in children with dental caries.

We found that age group 3-4 years had 24 patients, 4-5 years had 54, 5-6 years had 46, 6-7 years had 26 and 7-8 years had 12. George et al<sup>8</sup> conducted a study in children with dental caries. Saliva samples were collected from children with ECC prior to dental treatment and 3-month post treatment. The salivary IL-6 levels were analyzed using the ELISA method. The gingival index was also timely recorded. Oral health awareness sessions were conducted for children and their parents at regular intervals during the 3-month study period. The mean level of salivary IL-6 before and 3 months after treatment had reduced and this reduction was statistically significant. The gingival index scores had also reduced significantly 3-months post treatment.

IL-6 had previously been classified as a proinflammatory cytokine. Therefore, it was first thought that the exercise-

induced IL-6 response was related to muscle damage. However, it has become evident that eccentric exercise is not associated with a larger increase in plasma IL-6 than exercise involving concentric "nondamaging" muscle contractions. This finding clearly demonstrates that muscle damage is not required to provoke an increase in plasma IL-6 during exercise.<sup>9</sup> As a matter of fact, eccentric exercise may result in a delayed peak and a much slower decrease of plasma IL-6 during recovery.

## CONCLUSION

Authors concluded that there was high level of IL- 6 in children with dental caries.

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