Sana'a University Journal of Medical and Health Sciences
https://journals.su.edu.ye/index.php/jchm

Vol. 17 | No. 1 | Page 10 – 20 | 2023 | ISSN: 2958-7476
Doi:10.59628/jchm.v17i1.210

Tumor necrosis alpha (tnf-α) levels in the human gingival sulcus: rates and factors affecting its levels in healthy subjects

Hassan Abdulwahab Al-Shamahy[2,3,4,*], Omar Ahmed Ismael Al-dossary[1,2,4], Ikram Ayad Anwar Al-Adhami [5], **Khalid Al-dhorae[6]**

[1]Orthodontics, Pedodontics and Prevention Department Faculty of Dentistry, Sana'a University, Yemen. [2]Departement of Basic Sciences, Faculty of Dentistry, Sana'a University, Republic of Yemen.
[3]Medical Microbiology department, Faculty of Medicine, Genius University for Sciences & Technology, Dhamar city, Yemen. [4]Medical Microbiology and Clinical Immunology Department, Faculty of Medicine and Health Sciences, Sana'a University, Yemen
[5]Biochemistry Department, Faculty of Medicine and Health Sciences, Sana'a University, Yemen
[6]Department of Orthodontics, college of Dentistry, University of Ibn al-Nafis for medical sciences, Sana'a, Yemen ***Corresponding author:** *h.shmahe15@su.edu.ye*

ARTICLE INFO

Article history:
Received: March 2, 2023
Accepted: May 30, 2023
Published: June, 2023

KEYWORDS

1. Gingival crevicular fluid (GCF)
2. normal level
3. pro-inflammatory cytokine
4. tumor necrosis factor-α (TNF-α)

ABSTRACT

Background and objective: Gingival crevicular fluid (GCF) provides an exceptional window for investigation of the periodontal condition in which levels of inflammatory mediators, which, as a consequence of the increased local destruction of connective tissue structural elements, are ideal markers of disease activity can be appreciated in the GCF. This study aimed to investigate the levels of tumor necrosis factor-alpha (TNF-α) in the human gingival sulcus of healthy subjects and the influence of host factors such as age, sex, and tooth type used on pro-inflammatory biomarkers.

Methods: Eighty-seven patients, 54 (62.1%) female and 33 (37.9%) males (aged 12–34 years; mean 19.58±4.4 years), participated in this study. Each subject underwent a session on professional oral hygiene and received oral hygiene instructions. Gingival crevicular fluid (GCF) sampling was conducted (baseline). GCF was collected from the central incisor, the lateral incisor, the Canine, the First premolar and the Second premolar in this study. The concentration of the pro-inflammatory cytokine (TNF-α) present in the GCF was evaluated by Enzyme-Linked Immunosorbent Assay (ELISA), following manufacturers' recommendations. Differences in mean TNF-α concentrations (pg/ml) of the teeth selected for sample collection for each individual with variables that included age, sex, and tooth type for GCF samples, were determined.

Results: In total, the mean ± SD of central incisor TNF-α was 31.88 ± 4.99 pg/ml, and ranged from 20.22 to 40.47 pg/ml; the variance in all individual values was significantly distributed on the normal curve with t-test of 59 and $p < 0.001$. For males the TNF-α concentration (mean ± SD) of central incisor was 39.25 ± 7.26 pg/ml Vs. 40.98 ± 9.24 pg/ml for females. For the lateral incisor, Canine, first premolar and Second premolar: total, males and females; the mean ± SD of TNF-α level were roughly similar to that of the central incisor. A lower level of TNF-α was in <16 years (37.54 ± 9.5 pg/ml). These findings differ from those of the 16-25 years age group and 26-34 age group in which a significantly higher value was recorded (p=0.035). **Conclusion:** This study provides the upper limit of normal values for TNF-α levels for people aged 12-34 years in the GCF. These upper limits of normal values will guide dentists in Yemen when considering the diagnosis of periodontal disease, as well as its role during orthodontic tooth movement as they play an important role in the activities of Osteocytes, and will provide useful baseline data for future studies of interventions against periodontal disease; and the movement of teeth by orthodontic appliances, in Yemen. Also, this data can also be applied to neighboring Yemeni cities and neighboring countries.