

**Republic of Iraq  
Ministry of Higher Education  
and Scientific Research  
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College of Dentistry**



# **Oral Findings, Microbiology, Tumor Markers and Epstein Barr Virus Antibodies in Serum and Saliva of Hodgkin's and Non-Hodgkin Lymphoma Patients Receiving Chemotherapy**

A thesis

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# Abstract

## **Background:**

Lymphoma is a group of hematological malignancies that grow from lymphocytes and it is of two main categories Hodgkin and non-Hodgkin's lymphoma. Studies showed a close correlation between chemotherapy and the frequency of oral complications; reduced salivary flow- rate and opportunistic infections. This may lead to interruption in commensal microorganisms by the cancer itself, or the malignancy linked secondary immunodeficiency.

Cancer antigen 125 is a glycoprotein showed by normal tissues, originated from coelomic epithelia such as peritoneum, pericardium, fallopian tubes and endometrium. Cancer antigen 125 levels are elevated in serum and saliva of patients with different types of benign and malignant conditions that involve stimulation of these tissues.

Interlukin-1  $\beta$  is a key pro-inflammatory cytokine released upon infection, cellular injury and antigenic challenge; it could be a potential biomarker to predict the higher risks of cancer or patient's prognosis.

Epstein Barr virus may be associated with different types of lymphoma and supposed to play a significant role in lymphoma-genesis.

## **Aims of study:**

The aims of this study were to determine the incidence of oral findings, microbiology, salivary flow-rate and estimation of salivary and serum cancer antigen 125, interlukin-1  $\beta$  and Epstein Barr virus (viral capsid antigen/ IgM and IgG) in lymphoma patients receiving chemotherapy in comparison with healthy control. Also, to investigate the relation between serum and salivary parameters in study sample and finally to find the correlation between salivary parameters (salivary flow rate, salivary cancer Antigen 125, interlukin-1  $\beta$  with bacteria and yeast viable count).

**Subjects, Material and Methods:**

Seventy five subjects were enrolled in this study, divided into two groups: the first patients group with 45 lymphoma patients; 15 patients were with Hodgkin and 30 patients were with non-Hodgkin lymphoma; and the second control group was with 30 subjects with no history of any systemic diseases.

Intra oral examination was done for each individual to record oral findings in lymphoma patients. Saliva and blood serum were collected, salivary flow rate was measured and levels of salivary and serum cancer antigen 125, interleukin-1  $\beta$  and Epstein Barr virus (viral capsid antigen/ immunoglobulin M and immunoglobulin G) were measured by enzyme immunosorbent assay, before chemotherapy, after 3 cycles and one month after finishing chemotherapy.

**Results:**

The most frequent oral findings in lymphoma patients undergoing chemotherapy were the dry mouth, taste alteration, burning mouth syndrome, angular cheilitis, with dry mouth and taste alterations in non-Hodgkin's lymphoma patients were with a highly significance differences after 3 cycles chemotherapy and one month post- chemotherapy.

Streptococcus and Pseudomonas spp. were the predominant microorganism isolate in Hodgkin and non-Hodgkin's lymphoma patients compared to control group, with the mean viable count of oral bacteria and yeast were higher in lymphoma patients compared to control group.

Salivary flow-rate was significantly lower in patients with lymphoma compared to control group, with the lowest flow- rate, was recorded after 3 cycles chemotherapy.

Statistically, there was significant difference in serum and salivary cancer antigen 125, interleukin-1  $\beta$  and Epstein Barr virus between lymphoma patients and control group. This study showed that 80% of patients were with positive result of Epstein Barr virus (viral capsid antigen/ immunoglobulin M and immunoglobulin G index) compared to healthy control (46.6%). Considering of saliva, this study didn't

detect any positive ELISA reading for the salivary Epstein Barr virus (viral capsid antigen/ immunoglobulin M and immunoglobulin G index); however, salivary Barr virus antibodies was significantly higher in lymphoma patients compared to control group.

**Conclusions:**

The most frequent oral findings in lymphoma patients are dry mouth, taste alteration, burning mouth syndrome, angular cheilitis, and oral herptic lesions.

*Streptococcus and Pseudomonas* spp. are the most predominant gram positive and negative bacterial isolate, respectively.

This study showed an increased in the incidence of *Candida albicans*; *Klebseilla pneumonia*; *Serratia* spp; *Raoultella planticola*; *Methylobacterium* spp; *Acintobacter Iwoffii*; *Brevundimonas* spp. and *Rhizobium radiobacteria*.

Serum and salivary cancer antigen125 in lymphoma patients is significantly higher before chemotherapy and decreased one month post-chemotherapy, so it could be used as a tumor marker for monitoring the response to the chemotherapy and in patients follow up of detecting an early cancer relapse.

The levels of serum and salivary interlukin-1 in lymphoma patients is significantly higher than control subject, thus it may play a role in the pathogenesis of lymphoma.

Lymphoma patients on chemotherapy need a comprehensive professional oral care with oral hygiene instruction.