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Thesis Title	Immunological and microbiological factors affecting osseointegration in dental implants			
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Abstract	Osseo integrated dental implants have been remarkably improved and considered the most esthetical and functional alternative to missing teeth in the past half century. A cumulative success rate at ten years was satisfactory for both maxillary and mandibular implants. Since thirty years ago researches have validated the success of implants, however the treatment is not always successful resulting in implant loss. The major complication to be faced is loosening of dental implants with many affecting risk factors no matter what these factors are they affect the pathological and biological cascade in the periimplant supportive tissue in which periodontopathogens, protinascs, and cytokines mediates the extracellular matrix destruction This study focused on the immunological and microbiological factors able to mediates extracellular matrix destruction in the periimplant supportive tissue during infection, loosening and subsequent failure.			

	In order to evaluate the effect of some immunological markers and microbial pathogens on dental implants , 106 patients attending different implantation centers , 85 with successfully integrated implants and 21 with at least one diseased or failed implant were involved with 50 apparently healthy control subjects .The diagnosis have been well established based on clinical and radiographic criteria . Bacteriologically the microbial assay revealed a heavy bacterial growth from all cultured specimens with many predominant bacterial types including aerobic and anaerobic bacterial species, Serologically, gamma G immunoglobulin (IgG) antibody titer was studied in the three patient groups to find out the relationship between the immunological factors, host response and osseointegration process Cytokines quantitative assay was performed both systcmically in the patient sera and locally in the periimplant sulcular fluid including II.-l. IL-8 and GM-CSF. The ROC analysis has shown a newly reported interesting diagnostic role for serum antibodies and both systemic and local cytokines studies suggesting different levels of cut off values in predicting probability of implant failure. The DNA signals of two important immune markers MMP-9 and TIMP-2 were detected and estimated by the in situ hybridization technique in the gingival tissue sections taken from different cases their signals were determined by score (number of dotes) and intensity (severity of staining). No significant difference in implant treatment outcome has been noticed among different age and gender, nor antibiotic consumption between the three study groups, the major risk factor which shows

high failure rates was smoking however, posterior maxillary implants showed the higher

failure rates.

Bacteriologically, differences in positivity rates of the aerobic bacterial isolates were observed between the implant failure and osseointegrated sites 95% and 63.3% respectively, furthermore 75% and 16.7% rates were noticed in the growth of anaerobic periodontopathogenic bacteria in the diseased and osseointegrated sites respectively .*Provotella intermedia* , *Fasobacterium nucleatum* and *Actinomyces* at 20% , 4.4%, and 4% were detected for implant failure, osseointegrated , and control group respectively, while *Porphyromonas gingivals* was 15% unique in implant failure .

An increased mean serumlgG antibody titers to *bacteroides* species *(P. gingivals and P. intermedia)* 0.337 and 0.34 respectively and 0.413 for *S.cmreus* were associated with implant failure group while lower levels were noticed in those with successfully integrated implants 0.24, 0.232 , 0.249 respectively and 0.158. 0.18, 0.173 . For control group respectively .The quantitative assay of cytokines showed higher concentrations of 1 L-l. 1L-8. and GM-CSF among failure groups 370, 4300, and 40.5 pg/ml and 53. 1000. and 20 respectively compared to those in the other groups.

The obvious increase observed in Gelatinase-B . V1MP-9 score and intensity in addition to TIMP-2 in the failed implant tissue sections of periimplant tissue biopsies . specially in the failure group compared to osseointegrated ones which express slight increase in both score and intensity of these markers . These markers however, were associated with clear histopathologica! changes as inflammation, fibrous tissue formation in addition to bone destruction resulted from imbalance between MMP-9 and their

	tissue inhibitor TIMP-2.