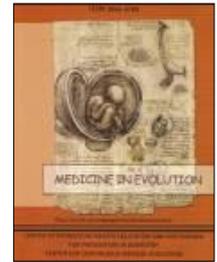


INTERRELATION BETWEEN URO- AND ODONTOLITHIASIS IN FAVORING PERIODONTAL PATHOLOGY



CH. TIULEA¹, F. MICLEA², M. IONESCU, D. MICLEA³

1. Private Dental Practice, Viersen, Germania
2. UMF „Victor Babes”, Department of Urology
3. Chemnitz University, Department of Urology

ABSTRACT

Urolithiasis leads to a progressive destruction of the urinary apparatus by obstruction or infection, degradation of renal function and onset of chronic renal failure. Dental tartar also represents an important factor favoring periodontal disease through the close contact between the bacterial plaque and the gingival tissue, making it difficult to approach and eliminate the plaque by usual therapeutic procedures. The investigations of factors which facilitate periodontal pathology, as well as the investigation of factors specific for CRF caused by urolithiasis are of crucial importance as they might offer specific therapeutic solutions in oral pathology.

The study was performed on a total of 106 cases with urolithiasis from the casuistic of the Timisoara County Clinical Emergency Hospital during the period 2009-2010. The study included a random selection of cases further allocated to a group A of 48 cases with pre-dialysis CRF, a group B of 20 cases with CRF treated by dialysis and a control group C of 38 cases with no CRF.

Apparently, both chronic renal failure caused by urolithiasis (as general favoring factor) and the presence of dental tartar (as local favoring factor) contribute to the occurrence and evolution of periodontal pathology.

Key words: urolithiasis, tartar, periodontal disease, chronic renal failure

Correspondence to:

Christian Tiulea
Adress: Stephanstrsse 5, 41061 Mochenglabach, Germany
E-mail address: tiulea@web.de

INTRODUCTION

The complex changes in humoral and cell-mediated immunity during urolithiasis-induced CRF might support the aberrant multiplication of the oral flora and might lead to the accelerated development of bacterial plaque regardless of the prophylactic means used by patients. On the other hand, the deterioration of the general health during urolithiasis-induced CRF, the neurologic changes, the renal anemia, induce in most cases behavioral changes which may influence oral hygiene habits in uremic patients.

The renal acidosis, calcium-phosphate balance disorders, insufficient synthesis of dihydroxycholecalciferol lead to multiple bone changes which are the basis for dental-maxillary

changes in patients with urolithiasis-induced CRF.

Concomitantly, the chemical mechanism generated by the decomposition of urea under the influence of urea synthesizing bacteria, might also contribute to the occurrence and maintenance of irritative lesions of the oral mucosa or exacerbate the gingival lesions produced by the mechanical irritation caused by the presence of dental tartar.

The investigations of factors which facilitate periodontal pathology, as well as the investigation of factors specific for CRF caused by urolithiasis are of crucial importance as they might offer specific therapeutic solutions in oral pathology.

MATERIAL AND METHOD

The study was performed on a total of 106 cases with urolithiasis from the casuistic of the Timisoara County Clinical Emergency Hospital during the period 2009-2010.

The study included a random selection of cases further allocated to a group A of 48 cases with pre-dialysis CRF, a group B of 20 cases with CRF treated by dialysis and a control group C of 38 cases with no CRF. Patients were subjected to a standard clinical and

biological examination of the urinary apparatus and a dental examination for diagnostic purposes.

The presence/absence of tartar as favoring factor for periodontal lesions and the prevalence of periodontal disease in the investigated groups and, in groups A and B, the associations between these periodontal diseases and the severity and complications caused by urolithiasis-induced CRF, respectively, were observed.

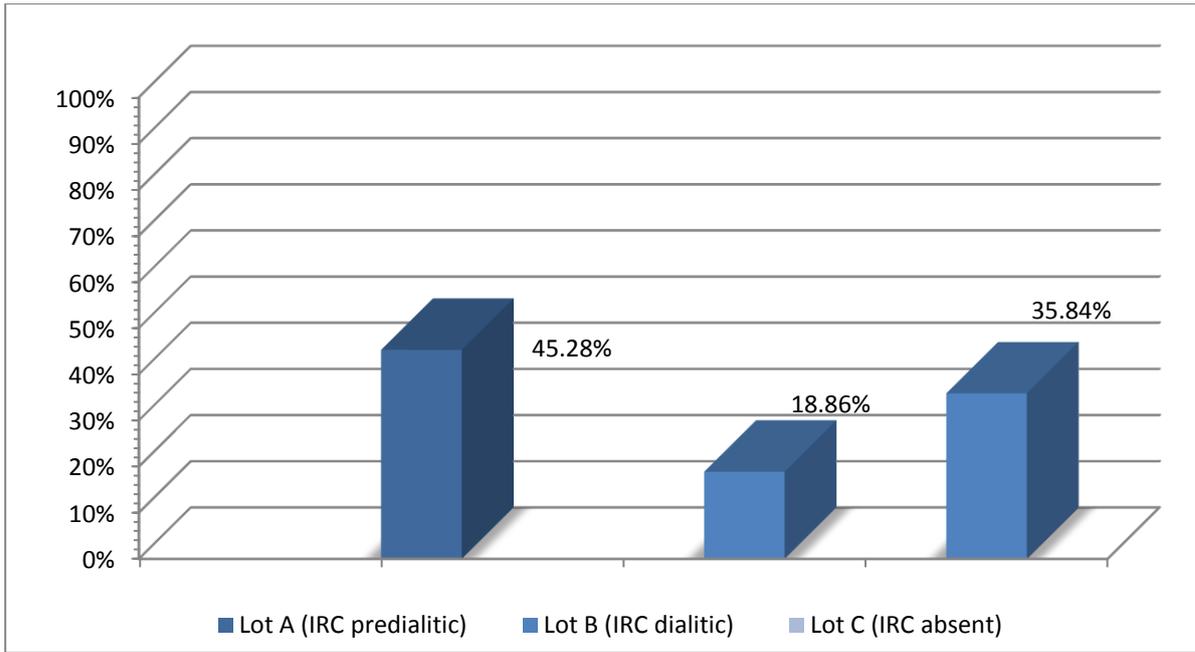
RESULTS AND DISCUSSIONS

The total of 106 cases (100%) composed of three study groups:

Group A (pre-dialysis CRF): 48 cases (46.28%);

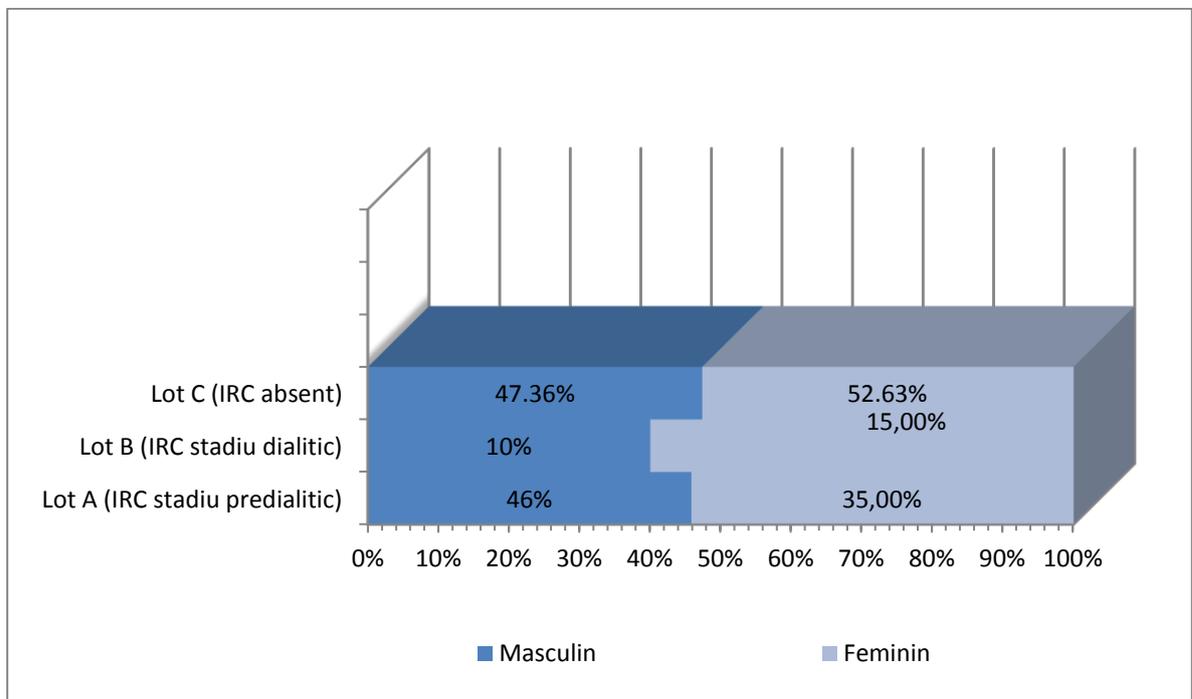
Group B (CRF in dialysis stage): 20 cases (18.86%);

Group C (no CRF): 38 cases (35.84%).

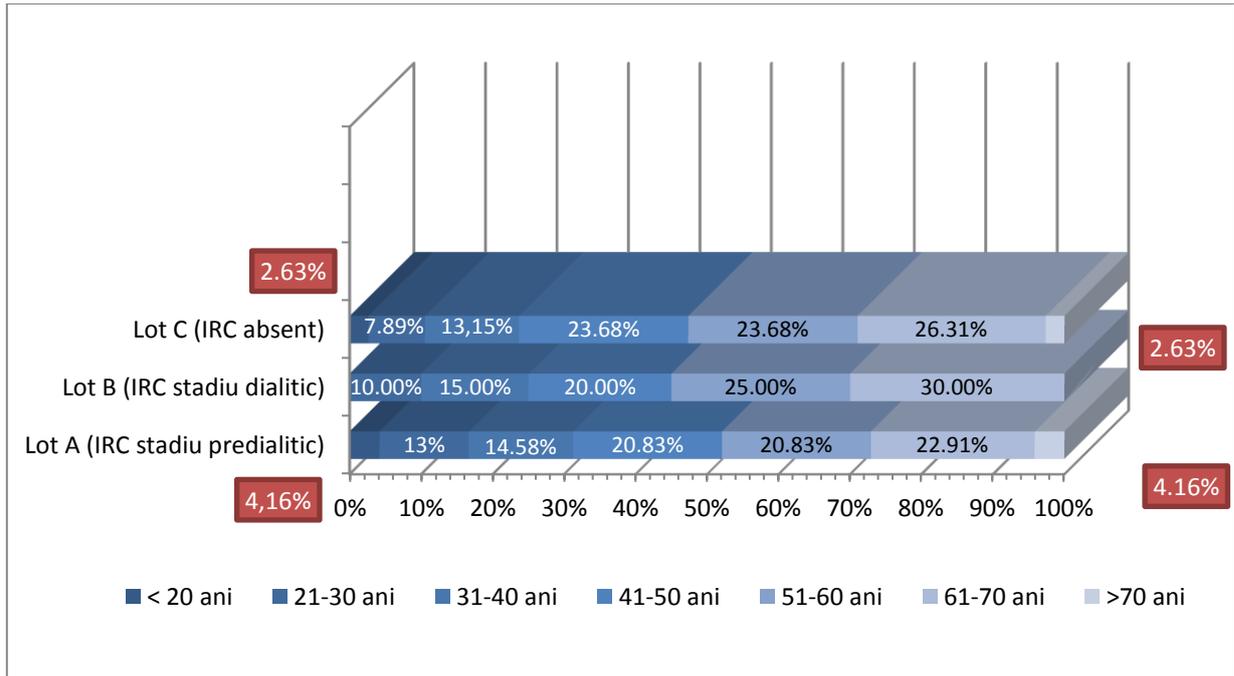


Graph 1. Classification of cases into groups
 Lot A (IRC predialitic) = Group A (pre-dialysis CRF)
 Lot B (IRC dialitic) = Group B (dialysis CRF)
 Lot C (IRC absent) = Group C (CRF absent)

Description of groups:



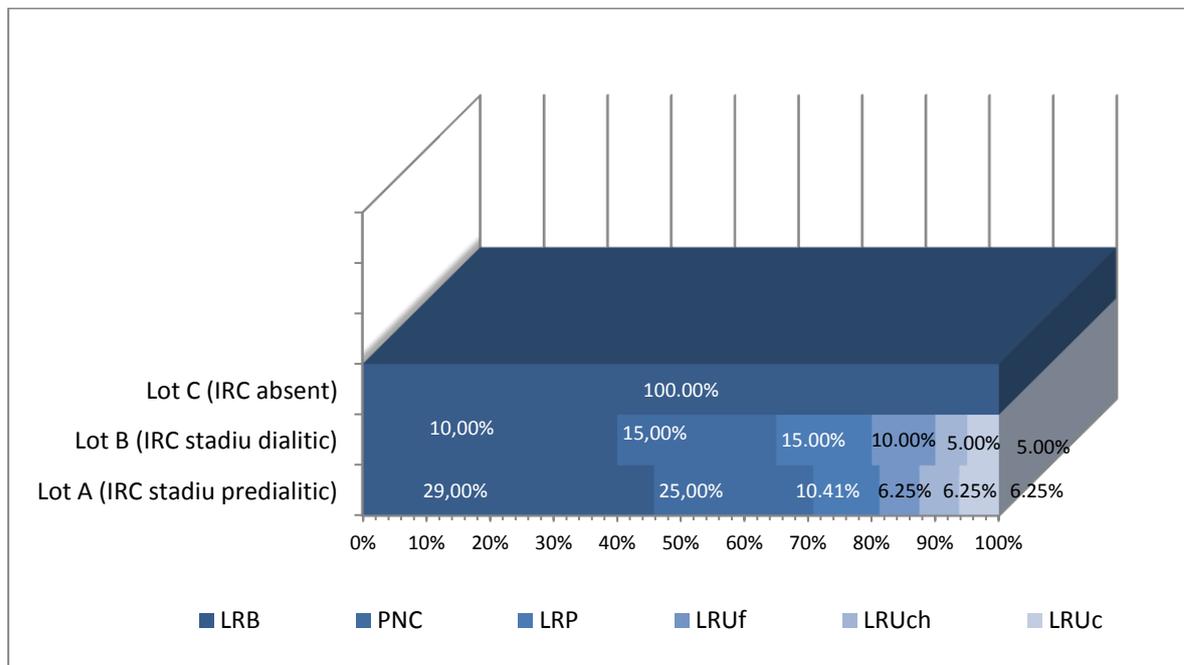
Graph 2. Gender distribution of cases



Graph 3. Age group distribution of cases.

Clinical diagnosis:
Depending on the etiology of CRF: LBK (lithiasis on bilateral kidney), CPN (uropathological chronic pyelonephritis), LPK (lithiasis on polycystic kidney),

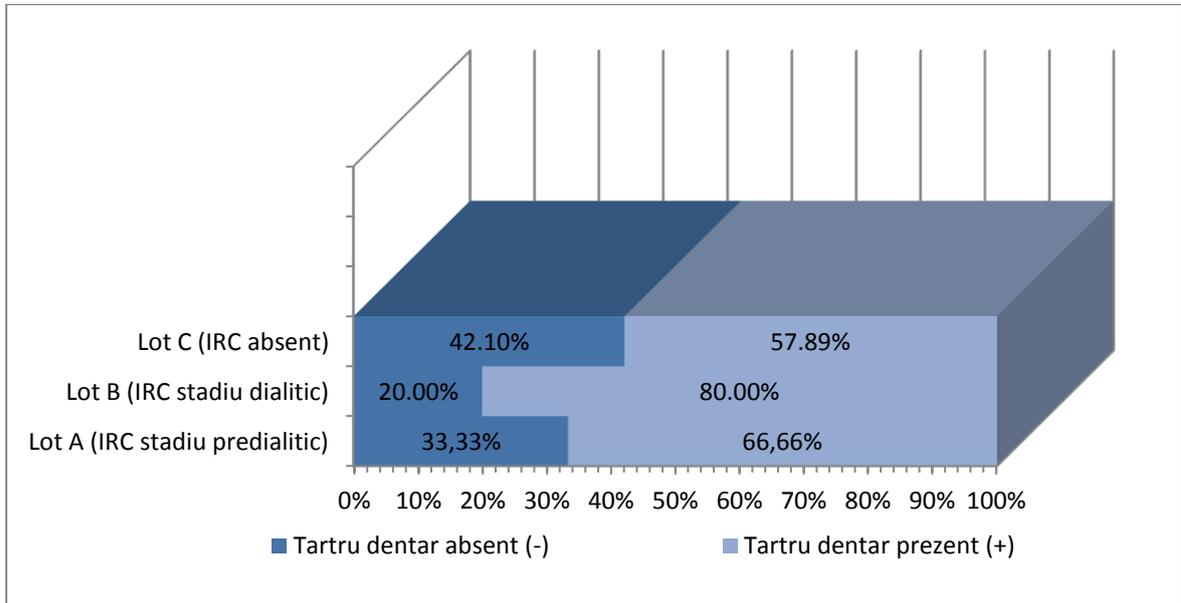
LSfK (lithiasis on single-functioning kidney), LSsK (lithiasis on single - post-surgical - kidney) and LScK (lithiasis on single congenital kidney) the following were observed:



Graph 4. Case distribution according to clinical diagnosis

Dental diagnosis:
Depending on the presence or absence of dental tartar diagnosed in the dental practice:

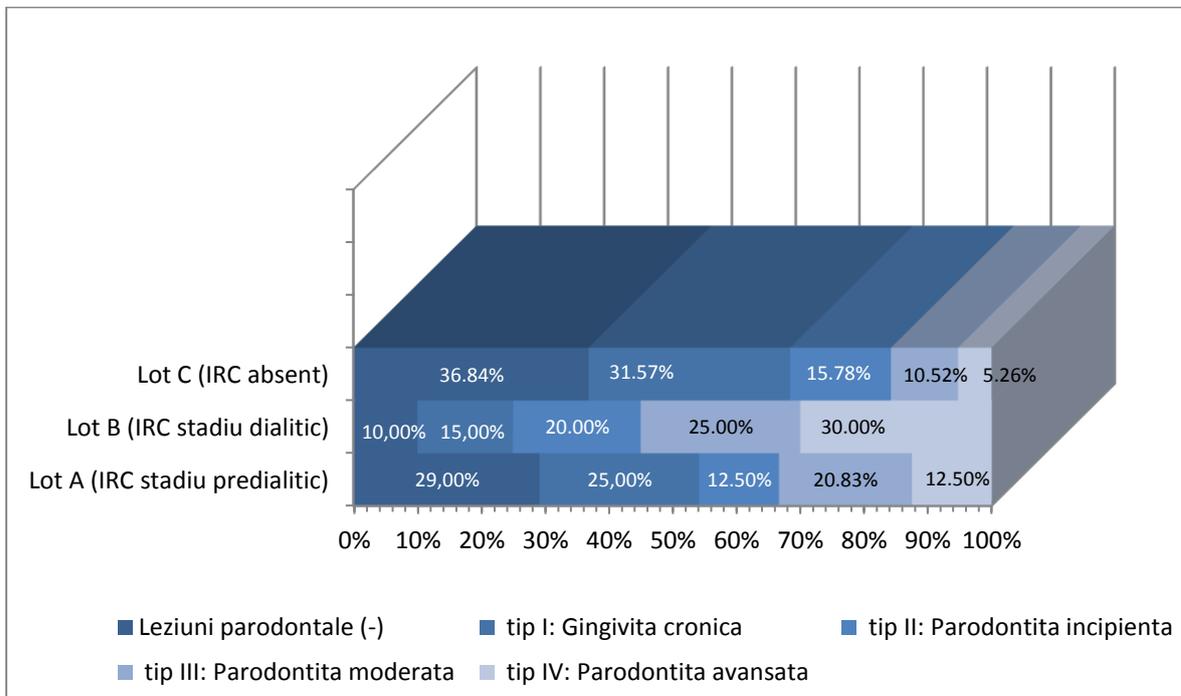
- dental tartar absent (-),
 - dental tartar present (+)
- The following results were found:



Graph 5. Case distribution according to the dental diagnosis

Depending on the absence or presence and type of periodontal lesions

diagnosed in the dental practice the following results were found:



Graph 6. Case distribution according to the dental diagnosis.

Together with the microbial determining factor, in the etiology of gingivitis and periodontitis, the contribution of local favoring factors (dental tartar, dental caries, edentations, dental-maxillary abnormalities, parafunctions, cigarette smoking, iatrogenic factors, etc.) and general factors (diabetes mellitus, cardiovascular, hematologic, liver, renal diseases, immune dysfunctions, nutrition disorders, endocrine disorders, nervous system disorders, etc.) must also be taken into account.

We monitored the presence/absence of tartar as local favouring factor and of urolithiasis with its major complication - chronic renal failure - as general favouring factors in periodontal pathology.

Dental tartar was found in 66.66% of CRF cases during pre-dialysis stages, 80.00% of dialysis CRF cases and in 57.89% of the cases with no CRF. We observed that the severity of periodontal lesions increased with the type of tartar deposits, i.e. reduced, moderate or large. Type I and II lesions were found in cases with reduced tartar deposits, type III lesions were found in cases with moderate deposits and type IV lesions in cases with large tartar deposits, but there were also cases in whom type I lesions were observed - gingivitis with no tartar in young subjects, in elderly patients, the tartar- gingivitis association, periodontitis was increased. The periodontal lesions were detectable in 70.83% of the CRF cases during pre-dialysis stages, in 90.00% of CRF cases subjected to dialysis and in 63.16% of CRF-free cases. The prevalence of periodontal lesions is significantly higher in CRF cases subjected to dialysis as compared to the control group.

The severity of periodontal lesions is different among the three studied groups. The chronic gingivitis lesions

are predominant in the control group (CRF absent), whereas advanced periodontitis lesions are predominant in the group of CRF patients subjected to dialysis. This finding might also be interpreted according to the idea that the severity of periodontal lesions seems proportional with the survival period of CRF patients and with the injuries caused by long term treatment. The severity of periodontal lesions is dependant on age in all three studied groups. The average age of patients correlated to the type of periodontal lesion is lower in CRF patients, so they present earlier and more severe periodontal lesions as compared to the control group patients where CRF is absent. The severity of CRF, the number of complications and their severity are in inverse proportion with the residual renal function. The mean values of serum urea and creatinine are significantly higher in cases with severe periodontal lesions as compared to those with mild periodontal lesions, both in the pre-dialysis CRF group and in the dialysis CRF group. Apparently, the severity of periodontal lesions increases in parallel with the increase in nitrogen retention both in the pre-dialysis (patients under conservative treatment) and in the dialysis CRF groups (patients treated by hemodialysis).

Also, the general health of the CRF patient, the effort capacity and, generally, the subjective life standard are largely influenced by the presence of renal anemia.

The relation between the severity of renal anemia and that of periodontal lesions suggests that CRF patients have increasingly severe periodontal lesions as the degree of anemia increases, with no possibility to classify anemia either as favoring factor for severe periodontal lesions or just as the expression of CRF severity itself.

CONCLUSIONS

Apparently, both chronic renal failure caused by urolithiasis (as general favoring factor) and the presence of

dental tartar (as local favoring factor) contribute to the occurrence and evolution of periodontal pathology.

REFERENCES

1. Addy M., Slayne M.A., Wade WG "The formation and control of plaque. An overview" J.Applied Bacterial, 2008;
2. Al-Shammari KF, Al-Khabbaz AK, Al-Ansari JM, Neiva R, Wang HL., "Risk indicators for tooth loss", J Periodontol, 2005;76(11):1910-1918.
3. Block GA, Hulbert-Shearon TE, Levin NW, et al., "Association of serum phosphorus and calcium x phosphate product with mortality risk in chronic hemodialysis patients: a national study", Am J Kidney Dis 2008;31:607-617
4. C. Burlibasa, "Chirurgie orala si maxilo-faciala", Ed.medicala, Bucuresti, 1999
5. Chow AW., "Infections of the oral cavity, head, and neck. In: Mandell GL, Bennett JE, Dolin R., eds. "Principles and Practice of Infectious Disease. 5th ed." Philadelphia, Pa: Churchill Livingstone; 2000
6. Daugirdas JT, Blake PG, "Handbook of dialysis, 3rd ed." Lippincott, Williams & Wilkins, 2001: 25-35.5.
7. Dimitriu H.T., "Parodontologie, ed 3-a", Ed. Viata Medicala romaneasca, Bucuresti, 1999.
8. Druke TB, Locatelli F, Clyne N, et al., "Normalization of hemoglobin level in patients with chronic kidney disease and anemia", N Engl J Med, 2006; 355: 2071-2084.
9. Dumitriu Traian "Parodontologie", Ed. Viata Medicala Romaneasca, 1998
10. Harrison, "Principii de Medicina Interna, editia 14," Ed. Teora, Bucuresti 2003
11. Doina Onisei - "Parodontologie", Editura Mirton, Timisoara, 1998
12. Lowrie EG, Lew NL, "Death risk in hemodialysis patients: the predictive value of commonly measured variables and an evaluation of death rate differences between facilities". Am J Kidney Dis 1990;15:458-482
13. Silvia Martu, Constanta Mocanu "Parodontologie clinica", Ed. Apollonia, Iasi, 2000
14. Preshaw PM, Hefti FA, Jepsen S, Etienne D, Walker C, Bradshaw MH., "Subantimicrobial dose doxycycline as adjunctive treatment for periodontitis", J Clin Periodontol.2004; 31:697 - 707
15. Ramfjord SP, ASH M.M. Jr., „Parodontologie et Parodontie-Aspects theoretiques et pratiques”, Paris, Masson, 2010
16. Slots J., "Selection of antimicrobial agents in periodontal therapy", J Periodontal Res.2002; 37:389 -398
17. Stel VS, Kramer A, Zoccali C, et al., "The 2007 ERA-EDTA registry annual report", NDT Plus 2009;2:514-521.
18. Tezal M, Wactawski-Wende J, Grossi SG, Dmochowski J, Genco RJ., "Periodontal disease and the incidence of tooth loss", J Periodontol. 2009; 76(7): 1123-1128
19. Theilade J, Schroeder H: Recent results in dental calculus research, Int Dent J 16:205, 2000
20. Tibbetts L, Kashiwa H: A histochemical study of early plaque mineralization, Abstract No 616, J Dent Res 19:202, 1996.
21. White D: Dental calculus: recent insights into occurrence, formation, prevention, removal and oral health effects of supragingival and subgingival deposits, Eur J Oral Sci 105:508, 1997