

Modern Science

Moderní věda

№ 2 - 2019

scientific journal

vědecký časopis

Prague Praha

MODERN SCIENCE - MODERNÍ VĚDA

№ 2 - 2019

**Incorporated in**  
*Czech Republic*  
MK ČR E 21453  
published bimonthly  
signed on the 26th of April 2019

**Evidenční číslo**  
Česká republika  
MK ČR E 21453  
Vychází šestkrát do roka  
podepsáno k tisku 26. dubna 2019

**Founder**  
*Nemoros*  
Main office: Rubna 716/24  
110 00, Prague 1, Czech Republic

**Zakladatel**  
*Nemoros*  
Hlavní kancelář: Rybná 716/24  
110 00, Praha 1, Česká republika

**Publisher**  
*Nemoros*  
Main office: Rubna 716/24  
110 00, Prague 1, Czech Republic

**Vydavatel**  
*Nemoros*  
Hlavní kancelář: Rybná 716/24  
110 00, Praha 1, Česká republika

*The East European Center  
of Fundamental Researchers  
Rubna 716/24  
110 00, Prague 1, Czech Republic*

*Východoevropské centrum  
základního výzkumu  
Rybná 716/24  
110 00, Praha 1, Česká republika*

**Address of release**  
*Modern Science*  
Rubna 716/24 , 110 00, Praha 1  
Czech Republic

**Adresa redakce**  
*Moderní věda*  
Rybná 716/24, 110 00, Praha 1  
Česká republika

Editorial Board / Redakční rada  
*Dr. Iryna Ignatieva, Ph.D. Diana Kucherenko, Roman Rossi*

Editorial Council / Redakce  
*Dr. Oleksii Hudzynskiy, Dr. Halina Aliakhnovich, Ph.D. Angelina Gudkova,  
Dr. Iryna Ignatieva, Ph.D. Diana Kucherenko, Dr. Natalia Yakovenko,  
Dr. Oleksandr Makarenko, Dr. Natalia Mamontova, Ph.D. Nataliya Chahrak,  
Dr. Iryna Markina, Ph.D. Nataliia Ivanova, Dr. Yuriy Chernomorets*

Chief-editor / Vedoucí redaktor  
*Dr. Iryna Ignatieva*

## PERIODONTAL STATUS OF PATIENTS IN DIFFERENT PERIODS AFTER TOTAL OVARECTOMY

**Andriy Samoilenko,**

*Doctor of Medicine, Professor,*

**Inna Horb-Havrylchenko,**

*Candidate of Medicine, Associate Professor of the Department of Dental Therapy,  
SI “Dnipropetrovsk Medical Academy of the Ministry of Health of Ukraine”*

**Annotation.** *Perspective study of the parodontium tissues condition in terms of the women within different periods after total ovariectomy has been carried out. Analysis of the obtained results has demonstrated that the examined groups of patients are characterized by the progressive increase in the values of periodontal indices and tests in parallel with the lengthening of surgical menopause duration. Disease severity as well as progress of inflammatory and destructive process in the parodontium aggravates within the periods from 3 to, especially, 5 and more years after total ovariectomy.*

**Key words:** *generalized parodontitis, ovariectomy, parodontal status.*

Evaluation of the role of female sex hormones in functional status of the parodontium tissues has been attracting the researchers' attention for a long time [1,2]. Among the causes of the development and progression of parodontal abnormality after ovariectomy, authors pay attention to numerous factors; however, the majority of the researchers connect the development of parodontosis with the decrease in mineral density of the axial skeleton bone and alveolar bone resorption associated with it [3], i.e. osteoporosis is of special attention for dental practitioners [4]. Osteoporotic changes in the skeleton effect dental plates as well aggravating destruction of both alveolar bone and parodontium conjunctive tissue [5,6]. Basing upon the accumulated data, American Dental Association considers osteoporosis as a risk factor for the development of inflammatory diseases of parodontium [7].

Thus, the basic tasks in the modern parodontology are to find and substantiate the application of the means of pathogenetic therapy as well as to differentiate the prescription of treatment agents according to the clinical findings of parodontitis, stomatological status, and general patient status [8,9]. Dependence of the parodontium issues status upon the hormonal status of patients with surgical menopause determines the necessity to include specific osteoporosis medications into the traditional scheme of generalized parodontitis treatment [10].

In terms of the current stage of clinical stomatology development, it is not difficult to make a diagnosis of parodontium diseases [11]. At the same time, determining the nature of clinical progression, prognosis of the disease development, interconnection with general state of a patient, ratio between changes in parodontal complex and skeletal system in general require further analysis [12]. Issues concerning the interrelation between osteoporotic process in the alveolar bone and terms after ovariectomy concerning the women without hormonal replacement therapy are still studied less than fully. The obtained

data would make it possible both to determine the role of hypoestrogenism in the progress of resorptive progress and to define risk groups as for the development and clinical course of the inflammatory and destructive disease.

Objective is clinical study of the parodontium tissues state in terms of the women with generalized parodontosis within different periods after total ovariectomy.

**Objects and methods of the study.** Main survey group included 108 women after total ovariectomy at the age from 30 to 50 years old. Duration of surgical menopause is more than a year. Survey groups included only the women who did not get hormonal replacement therapy. To study the state of parodontium tissues in terms of the selected group, patients of the main group were further divided into 3 subgroups taking into consideration the duration of artificial menopause. Subgroup one involved 40 women within the three-year period after total ovariectomy; subgroup two included 32 women within the period of 3-5 years; and group three involved 36 women within the period more than 5 years.

Peer group included 25 women of the similar age with the preserved ovarian function suffering from generalized parodontosis.

Clinical examination of the patients was performed according to the generally accepted scheme including analysis of patient's complaints, history taking, examination, and objective data. Objective assessment of the parodontium tissues state required taking into account parameters of parodontal testing and indices: data on parodontal index (PI Russel, 1956), Svrakov's iodine number, PMA index (in Parma modification (1960), gingival bleeding index (Mühlemann-A.S.Mazor, 1975), CPITN index. State of bone tissue of the alveolar bone was assessed according to orthopantomograms and spot radiographies of the specific teeth groups.

Statistic data were processed by means of a computer with the help of Statistica 8.0 (Stat Soft, Inc.), Biostatistics 4.03 (Mc Graw Hill) statistic programs and Excel 2007 (Microsoft, Corp.) electronic tables powered by Windows Vista (Microsoft, Corp.). Differences between the compared values were determined according to the Student criterion and considered to be accurate in terms of critical level of significance of differences ( $p$ ) being less than 0.05.

**Research results and their discussion.** It has been determined that progressive inflammatory and destructive process in parodontium increases steadily depending upon the menopause duration and patients' age (Fig.1).

Comparison of the severity of inflammatory process in terms of the women of main group with the similar data of the peer group women has shown the following: woman of the main group demonstrated mostly II and III severities of generalized parodontitis while the women with normal ovarian function were diagnosed the incipience and I severity of the disease. Thus, in terms of the women of main group, severity I was diagnosed in 32.4 % cases; severity II – in 38.0 %; and severity III – in 29.6%; while in terms of healthy women, severity I was determined in case of 72.5% of those under observation; severity II – in terms of 22.5%; and severity III – in terms of 5.0% of the patients.

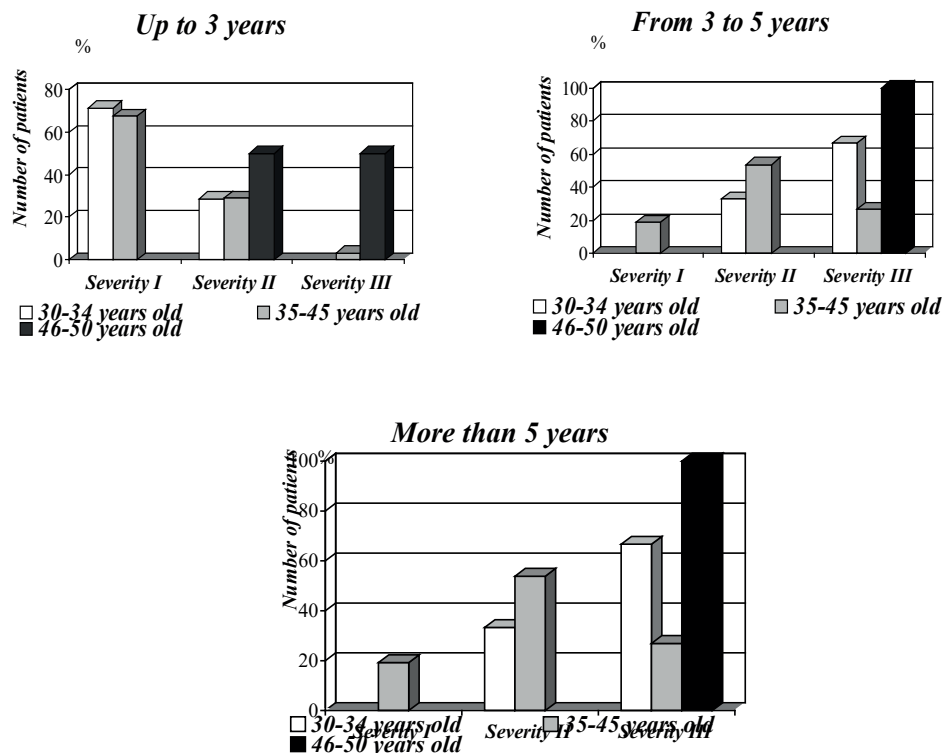


Fig.1. Dependence of the severity of the generalized periodontitis upon the duration of artificial menopause.

It has been defined that within three-year period after total ovariectomy, women demonstrated mostly severity I of the generalized parodontitis (65% of the cases); severity III was rather rare (5% of the cases) (Fig.1). On the contrary, in terms of the women with a long-term artificial menopause being more than 5 years, severity III of generalized parodontitis was registered in case of 50% of the patients; severity II – in case of 38.9%; and severity I – just in case of 11.1% of the patients under observation.

Thus, while comparing the obtained data on the generalized parodontitis severity in terms of the women after complete ovariectomy with the menopause duration, high severity of the disease is most often observed in terms of the patients with artificial menopause after 5 and more years.

There are no significant differences in clinical manifestations of generalized parodontitis in terms of women with artificial menopause within the periods up to 1 year and patients without co-morbidities only in the context of severity degree 1 of the disease. During the examination, the patients presented problems for bleeding gum while teeth brushing, itching and heating in the gums. During the objective examination of the patients of that group, signs of gum catarrhal inflammation (insignificant hyperemia, edema) have

been identified. In all the cases, the following has been observed: soft dental calculus and supra- and subgingival dental deposits, mostly on approximal and glossal surfaces of frontal teeth and glossal surfaces of premolars and molars. Depth of periodontal pockets was down to 3.5 mm. Tooth loosening was within the physiological normal state or some higher (loosening degree 1).

Svrakov's iodine number was within the range of  $1.6 \pm 0.3$  points. Average value of PMA index was  $38.6 \pm 14.2$  %, PI was  $1.04 \pm 0.20$  points, and gingival bleeding index was  $1.49 \pm 0.20$  points. Along with that, while analyzing CPITN index, it was determined that the prevalence rate of pathological changes in parodontium as for the women after total ovariectomy was  $1.99 \pm 0.20$  points while women from the peer group demonstrated  $0.94 \pm 0.20$  points.

In terms of the women with menopause duration being 3-5 years, clinical symptom complex of generalized parodontitis progresses in parallel with the duration of the period after total ovariectomy (Table 1).

Within the group, patients presented problems as for gum bleeding during teeth brushing and eating solid food, bad breath, purulent discharge and pain in the gums, loosening of some teeth groups.

Objective examination has helped detect evident hyperemia and edema of interdental papillae and alveolar bone mucosa, serosanguineous and in some cases seropurulent exudate. The patients under study demonstrated such characteristic peculiarities as deep parodontal pockets (deeper than 5 mm) and considerable teeth loosening (loosening degrees II and III). All the patients showed abundant soft dental calculus, and supra- and subgingival dental calculus.

Svrakov's iodine number indicated more evident inflammatory process comparing to the one in terms of the women with a long-term artificial menopause up to three years ( $2.8 \pm 0.2$  points comparing to  $1.6 \pm 0.3$  points). Average value of PMA index was equal to  $65.7 \pm 10.3$  %, PI –  $4.22 \pm 0.30$  points, CPITN –  $3.62 \pm 0.45$  points, and gingival bleeding index –  $2.55 \pm 0.10$  points. Women with a long-term artificial menopause being more than 5 years demonstrated maximum inflammatory and destructive process in the parodontium tissues: average SPITN value was  $3.89 \pm 0.10$  points, PMA –  $78.8 \pm 10.6$  %, PI –  $6.55 \pm 0.60$  points, gingival bleeding index –  $3.80 \pm 0.20$  points, and Svrakov's iodine number –  $4.5 \pm 0.2$  points.

**Conclusions.** Duration of artificial menopause has negative effect upon a clinical signs of generalized parodontitis. Severity of the disease, progress of inflammatory and destructive process in the parodontium increase within the period from 3 up to 5 (especially, 5 and more) years after total ovariectomy. It is confirmed by the prevailing number of the patients suffering from 2-3 severity degree of parodontitis within the periods more than 5 years after ovariectomy.

The research has demonstrated that, according to the values of parodontal index, intensity of the inflammatory process increases in the structure of periodontal status of the patients along with the duration of artificial menopause. Proved increase in the parodontal index shows the progressive destruction processes in the parodontium tissues. PMA index,

gingival bleeding index, CPITN index, and Svrakov's iodine number have also appeared to be informative parameters to indicate basic signs of the disease.

Table 1

**Paraclinic parameters of parodontal status of the patients depending upon the duration of artificial menopause (M±m)**

Duration of artificial menopause	CPITN (points)	PMA (%)	Gingival bleeding index (Mühlemann, A.S. Mazor) (points)	Parodontal index (PI Russel) (points)	Svrakov's iodine number (points)
1-3 years (n=40)	1.99 ± 0.20*	38.6 ± 14.2*	1.49 ± 0.20	1.04 ± 0.20*	1.6 ± 0.3
4-5 years (n=32)	3.62 ± 0.45*	65.7 ± 10.3*	2.55 ± 0.10*	4.22 ± 0.30*	2.8 ± 0.2*
More than 5 years (n=36)	3.89 ± 0.10*	78.8 ± 10.6*	3.80 ± 0.20*	6.55 ± 0.60*	4.5 ± 0.2*
Peer group (n=25)	0.94 ± 0.20	54.1 ± 12.2	1.52 ± 0.20	2.85 ± 0.30	1.7 ± 0.2

Notes: 1. \* $p < 0.05$  is reliable relative to the peer group patients.

#### References:

1. Influence of hormonal variation on the periodontium in women / S. Amar, K. M. Chung // *Periodontol.* — 2000. — Vol. 6, № 1. — P.79 — 87.
2. Nishimura F. Periodontal disease /F. Nishimura, M. Iwashita, A. Yamashita // *Nihon Rinsho.* — 2012. — Vol.70, Suppl. 5. — P. 499 — 502.
3. Geurs N. Osteoporosis and periodontal disease / N. Geurs // *Periodontol.* - 2007. -Vol. 44, № 1. - P.29-43.
4. Women's Oral Health Issues. American Dental Association Council on Access, Prevention and Interprofessional Relations. 2006. URL: <http://www.ada.org/sections/professionalResources/>
5. Povoroznyuk V.V. Kostnaya sistema i zabolevaniya parodonta / Povoroznyuk V.V., Mazur I.P.// – Kiev, 2003. – 446 p. (In Ukrainian)
6. Maschenko I.S. Rol gormonalnih zmin u rozvitku osteoporozu alveolyarnoyi kistky u hvorih na generalizovaniy parodontit / Maschenko I.S, Gorb I. V. //- *Visnik stomatologiyi.* - 2001. - №2. P. 19-20 (In Ukrainian)
7. Jagelaviciene E. The relationship between general osteoporosis of the organism and periodontal diseases / E. Jagelaviciene, R. Kubilius // *Medicina (Kaunas).* — 2006. — Vol. 42, № 8. — P. 613 — 618.
8. I. V. Gorb-Gavrilchenko. OsoblivostI rozvitku, kliniki ta likuvannya generalizovanogo parodontitu v zhinok pislya ovarioektomyi : Avtoref. dis... kand. med. nauk /; Visch. derzh. navch. zakl. Ukrayini "Ukr. med. stomatol. akad.". – Poltava, 2006. - 18 p. (In Ukrainian)
9. Osteoporosis, jawbones and periodontal disease / R. Guiglia, O. Di Fede, L. Lo Russo [et al.] // *Med. Oral Patol. Oral Cir. Bucal.* — 2013. — Vol. 18, № 1. — P. 93-95.

10. Maschenko I.S. Effektivnost primeneniya osteotropnoy i zamestitelnoy gormonalnoy terapii u zhenshin posle totalnoy ovarioektomii, stradayuschih generalizovannym parodontitom, v zavisimosti ot osteoporoznogo protsessa v kostnyih strukturah parodonta / Maschenko I.S., Gorb-Gavrilchenko I.V. // Visnik stomatologiyi. - 2005. - №3 (48). - P.26-29 (In Ukrainian)

11. Grudyanov A.I. Diagnostika v parodontologii / A.I. Grudyanov. - M.: Meditsinskoe informatsionnoe agentstvo, 2004 - 95 p. (In Russian)

12. Gorb-Gavrilchenko I. V. Aktivnist osteoprozu kistkovoyi tkanini parodontu u zhinok z gipoestrogenemiyu, hvori na generalizovaniy pardontit / Gorb-Gavrilchenko I. V. // Novini stomatologiyi - 2002. - №1. - P.58-59 (In Ukrainian)