




# Recurrent herpetic stomatitis


## from workers of industrial enterprises burdened with their rhinitis

*Estomatitis herpética recurrente de trabajadores de empresas industriales agobiados por su rinitis*

 Olga Y. Kuznetsova, Associate Professor (Department of Protection of Human Health), Institute of Fundamental Medicine and Biology, Kazan Federal University. Born in a family of Ph.D.s, graduated from KSML in 1994 with honors degree. Author of 58 scientific articles. Published materials of abstracts of 24 scientific and practical conferences. Author of 2 monographs. ID Scopus 57193639462 e-mail: [kniga7555@mail.ru](mailto:kniga7555@mail.ru)

 Maya Aleksandrovna Kharitonova, Associate Professor (Department of Microbiology), Institute of Fundamental Medicine and Biology, Kazan Federal University. Fields of scientific interests: fundamental microbiology, medical microbiology, molecular biology. The author of over 20 scientific articles and 5 study guides. H-index is 3 (Scopus) and 4 (Google Scholar). ID Scopus 6603375646. e-mail: [maya\\_kharitonova@mail.ru](mailto:maya_kharitonova@mail.ru)

 Oleg Viktorovich Nesterov, Associate Professor (Department of Microbiology), Kazan State Medical Academy. Specialist in the field of maxillofacial surgery, since 2007 - head of the department of maxillofacial surgery and surgical dentistry. The author of over 37 scientific articles. H-index is 1 (Scopus), ID Scopus 57203024904, e-mail: [nesterov@kgma.ru](mailto:nesterov@kgma.ru)

 Tatiana Gennadievna Malanicheva, Professor (Propaedeutics of Children's Diseases and Faculty Pediatrics Department), Kazan State Medical University. The author of over 190 scientific articles. Research interests: pediatric pulmonology, allergology and immunology. Teaching disciplines: Pediatrics for students of medical, preventive medicine and dental faculties. H-index is 1 (Scopus). ID Scopus 8305600100, e-mail: [som5545@mail.ru](mailto:som5545@mail.ru)

Received: 04/26/2021 Accepted: 07/15/2022 Published: 07/25/2022 DOI: <https://doi.org/10.5281/zenodo.7342831>

### Abstract

At industrial enterprises, workers with recurrent herpetic stomatitis, aggravated by allergic rhinitis, were identified as a result of a study of recurrent herpetic stomatitis in industrial workers with allergic diseases, 87 patients aged 21 to 45 years were treated. Before and after immunomodulator therapy, the immune status of workers was assessed. Local immunity of the oral cavity (SIgA), indicators of cellular immunity (the reaction of blast transformation with phytohemagglutinin), indicators of humoral immunity (IgA, IgG, IgE) were assessed, and the C3 component of the complement was also looked at. The results obtained proved the clinical efficacy of the immunomodulatory drug, lengthening the remission period ( $p < 0,001$ ) of recurrent herpetic stomatitis, as well as improving the clinic of concomitant disease (allergic rhinitis).

**Keywords:** Therapy, Recurrent Herpetic Stomatitis, Allergic Rhinitis.

### Resumen

En empresas industriales se identificaron trabajadores con estomatitis herpética recurrente, agravada por rinitis alérgica. Como resultado de un estudio de estomatitis herpética recurrente en trabajadores industriales con enfermedades alérgicas, se atendieron 87 pacientes de 21 a 45 años. Antes y después de la terapia con inmunomoduladores, se evaluó el estado inmunológico de los trabajadores. Se evaluaron la inmunidad local de la cavidad oral (SIgA), indicadores de inmunidad celular (la reacción de transformación blástica con fitohemaglutinina), indicadores de inmunidad humoral (IgA, IgG, IgE) y también se observó el componente C3 del complemento. Los resultados obtenidos demostraron la eficacia clínica del fármaco inmunomodulador, alargando el periodo de remisión ( $p < 0,001$ ) de la estomatitis herpética recurrente, así como mejorando la clínica de la enfermedad concomitante (rinitis alérgica).

**Palabras clave:** Terapia, Estomatitis Herpética Recurrente, Rinitis Alérgica.

### Introduction

A healthy worker in industrial enterprises is a topical issue of our time. People working at the enterprise must be healthy and be safe. Every individual must be employed and healthy. After analyzing at industrial enterprises, we identified workers with recurrent herpetic stomatitis (RHS), aggravated by allergic rhinitis. Allergic rhinitis is one of the most common diseases and has a negative impact on human labor<sup>1-5</sup>. Human health is a leading component in the modern world<sup>6-9</sup>.

Only a healthy person can do their job effectively. The immune system plays a significant role in the health of workers in industrial plants. One of the causes of recurrent herpetic stomatitis (RHS) is a deficiency of secretory IgA and its decrease, which, in turn, protects the oral mucosa, stops communication with pathogenic microorganisms<sup>8,10,11</sup>. We decided to look at the immune status in this group of patients, to carry out a comparative analysis of immunological parameters before and af-

ter therapy with an immunomodulatory agent in workers with congestive hepatitis and aggravated by allergic rhinitis.

The aim of the study is to assess the therapy of RHS in industrial workers with allergic rhinitis.

## Methods

In order to study the role of the immunological status in industrial workers, we identified 87 workers with RHS, aggravated by allergic rhinitis. These patients made up the observation group at the age of 21 to 45 years. Of these, 49 are women and 38 are men. All employees were supervised by a dentist and allergist. Healthy working people are represented as a control group. After examining the workers, we carried out traditional therapy for the underlying disease. But the course of the disease remained the same, and the relapses of RHS did not decrease. Therefore, we prescribed to patients a drug with an immunomodulatory and antiviral effect – glucosaminylmuramyl dipeptide, which is an activator of innate and acquired immunity, enhances the body's defense against viral and bacterial infections<sup>12-14</sup>. The drug does not cause pathological changes in the internal organ<sup>15-17</sup>. The drug has good clinical efficacy<sup>18-20</sup>.

All patients with RHS, aggravated by allergic rhinitis, we carried out 2 courses of therapy during periods of exacerbation (autumn, spring). The workers were divided depending on the severity of the course of the RHS. The immunomodulator was prescribed in tablets of 1 tablet (1 mg) 3 times a day on an empty stomach 30 minutes before meals. The course was carried out for 10 days. Conducted 3 courses at intervals of 20 days.

Before and after immunomodulator therapy, all workers of industrial enterprises were examined, that is, they looked at their immunological status, which included local immunity of the oral cavity, humoral immunity, cellular immunity, and also looked at the phagocytosis system and the complement system. All workers were strictly under the supervision of an immunologist. When studying the indices of local immunity, the content of secretory immunoglobulin (SIgA) in saliva, which was determined by the method of radial immunodiffusion according to G. Mancini, was examined. We studied the parameters of the cellular link of immunity - the blast-transformation reaction of RBTL with phytohemagglutinin according to N. Ling's method<sup>9</sup>.

The indices of humoral immunity (IgA, IgG) were assessed using simple radial immunodiffusion<sup>10</sup>. The concentration of total (IgE) was assessed using (radioimmunosorbent test) using Pharmacia reagents, and the complement system (C3 component of the complement) was determined by the immunodiffusion method<sup>10</sup>.

## Results and Discussion

We evaluated the clinical efficacy of immunomodulatory drug in industrial workers with allergic rhinitis by immunological parameters before treatment, and then after treatment with an immunomodulatory.

Before treatment, the local immunity of the oral cavity (SIgA) was  $0,28 \pm 0,024$  g / l with mild severity,  $0,25 \pm 0,039$  g / l with moderate severity, with severe –  $0,19 \pm 0,055$  g / l. Humoral immunity (IgA) with mild severity was  $1,08 \pm 0,34$  g / l, with moderate severity –  $1,06 \pm 0,7$  g / l, with severe severity -  $1,09 \pm 0,6$  g / l. IgG indices were  $10,49 \pm 0,8$  g / l in mild severity,  $8,65 \pm 0,7$  g / l in moderate severity, and  $8,34 \pm 0,8$  g / l in severe severity. The IgE indices were  $277 \pm 1,61$  ME / ml in mild severity,  $329 \pm 1,43$  ME / ml in medium severity, and  $377 \pm 1,76$  ME / ml in severe severity.

Cellular immunity was assessed by PBTL with FGA. With a mild degree of the disease, the indicators were  $74,4 \pm 0,5\%$ , with a moderate degree –  $35,5 \pm 0,2\%$ , with a severe degree of severity –  $19,4 \pm 0,03\%$ . Indicators of C3 components of a complement with a mild degree were  $0,67 \pm 2,4$ , with an average severity –  $0,74 \pm 3,6$ , with a severe degree of severity –  $0,81 \pm 2,2$ .

After treatment with RHS with an immunomodulator in patients, the indices of local oral immunity (SIgA) were as follows: with mild severity –  $0,76 \pm 0,028$  g / l, with moderate severity –  $0,75 \pm 0,015$  g / l, with severe severity –  $0,76 \pm 0,052$  g / l. Indicators of humoral immunity (IgA) with mild degree were  $1,09 \pm 0,6$  g / l, with moderate severity –  $1,09 \pm 0,6$  g / l, with severe –  $1,14 \pm 0,9$  g / l; IgG indices were: with mild severity –  $12,57 \pm 0,7$  g / l, with moderate severity –  $12,11 \pm 0,4$  g / l, with severe severity –  $12,21 \pm 0,9$  g / l. IgE indices were: with mild severity -  $117 \pm 1,62$  ME / ml, with moderate severity -  $113 \pm 1,65$  ME / ml, with severe severity -  $124 \pm 1,41$  ME / ml. Cellular immunity (RBTL with FGA), its indicators were: with mild severity –  $52,4 \pm 0,3\%$ , with moderate severity –  $53,5 \pm 0,3\%$ , with severe severity -  $54,4 \pm 0,3\%$ . Indicators C3 of the complement components were: with mild severity –  $1,36 \pm 2,3$ , with moderate severity –  $0,76 \pm 1,6$ , with severe severity –  $0,75 \pm 2,3$ .

The therapy with the immunomodulator RHS in industrial workers with allergic rhinitis showed that the immunological indices of local immunity increased, that is, they approached the group of healthy workers. In the link of humoral immunity, IgA and IgG significantly ( $p < 0,001$ ) increased, and the concentration of IgE significantly ( $p < 0,001$ ) decreased. Cellular immunity - RBTL with FGA significantly ( $p < 0,001$ ) increased, which approached the group of healthy

## Summary

It can be concluded that a healthy worker is an essential component of the workforce of the planet. All patients who were examined before receiving immunotherapy felt tired and weak, and the work was hard for them. After the courses of therapy with an immunomodulator, this group of patients'

health improved, as evidenced by the clinical picture of RHS:

- Periods of illness decreased.
- Severe severity of RHS showed high recovery results (75%).
- The indicators of the immune status approached the group of healthy people.
- The clinic for the concomitant disease also showed improvements, and allergic Rhinitis became easier in 49% of cases.

## Conclusions

After the therapy, the workers began to feel more comfortable, were less likely to get sick, the periods of both the main (RHS) and concomitant diseases (allergic rhinitis) decreased, a stable remission of the disease began to be observed ( $p < 0,001$ ), and the indicators of the immunological status improved. Clinical studies have shown the effectiveness of the use of an immunomodulator in the treatment of RHS in industrial workers with allergic rhinitis.

## Acknowledgements

This paper has been supported by the Kazan Federal University Strategic Academic Leadership Program.

## Conflict of interest

the authors declare there is no conflict of interest.

**Funding:** no funding.

## References

1. Ryazantsev SV, Goncharov OI. Allergic rhinitis," Medical advice, 2018;20:76-79.
2. Trushenco NV. Allergic rhinitis: a modern view of pathogenesis treatment diagnosis. *Asthma and allergology*, 2014;1:2-8
3. Kuznetsova OYu, Nesterov OV, Maksimovskaya LN. Complex treatment of recurrent hermetic statistics in employees of industrial enterprises. *Stomatology*. 2018;4:16-18.
4. Ionova EL, Dobryukha A. Support immunity and add years to life. *Komsomolskaya Pravda*. 2018: p.11.
5. Salimov II. Clinic and treatment of allergic diseases. Moscow: GEOTAR-Media.2010:224p.
6. Yanov YK. Allergic rhinitis: modern aspects of therapy. *Bulletin of otorhinolaryngology*. 2018: -3.
7. Kolkhir PV. Evidence-based allergology – immunology. Moscow, - Practical medicine. 2010: 528s.
8. Glesson M, Pyne DB. Exercise effects on micesal immunity. *Immunol. Cell Biol*. 2000;78:536-44.
9. Ling NR, Spicer E, Tames K, N. Br T. Williamson, Haemat.,

1965;11:421-431.

10. Mancini GJ, Carbonara AT, Heremans JF. Immunochemical quantitation of antigens by single radial immunodiffusion. *immunochemistry*. 1965 Sep 1;2(3):235-IN6.
11. Petroni G, Buqué A, Zitvogel L, Kroemer G, Galluzzi L. Immunomodulation by targeted anticancer agents. *Cancer Cell*. 2021 Mar 8;39(3):310-45.
12. Wu X, Jiang J, Gu Z, Zhang J, Chen Y, Liu X. Mesenchymal stromal cell therapies: immunomodulatory properties and clinical progress. *Stem cell research & therapy*. 2020 Dec;11(1):1-6.
13. Nur'aeny N, Gurnida DA, Suwarsa O, Sufiawati I. Serum level of IL-6, reactive oxygen species and cortisol in patients with recurrent aphthous stomatitis related imbalance nutrition intake and atopy. *Journal of Mathematical and Fundamental Sciences*. 2020 Sep 1;53(3):286-96.
14. El Sayed SM, Almaramhy HH, Aljehani YT, Ahmed MO, Okashah A. TaibUVID for minimizing COVID-19 fatalities and morbidity: an evidence-based approach for better outcomes (a treatment protocol). *American Journal of Public Health Research*. 2020;8(2):54-60.
15. Pandit H, Hong YK, Li Y, Rostas J, Pulliam Z, Li SP, Martin RC. Evaluating the regulatory immunomodulation effect of irreversible electroporation (IRE) in pancreatic adenocarcinoma. *Annals of surgical oncology*. 2019 Mar;26(3):800-6.
16. Wittenberg GM, Stylianou A, Zhang Y, Sun Y, Gupta A, Jagannatha PS, Wang D, Hsu B, Curran ME, Khan S, Chen G. Effects of immunomodulatory drugs on depressive symptoms: a mega-analysis of randomized, placebo-controlled clinical trials in inflammatory disorders. *Molecular psychiatry*. 2020 Jun;25(6):1275-85.
17. Diaz CI, Zambrano AD, Naranjo AL, Shiguango NN, Carrasco AP, Córdova HS, Proaño CA, Diaz LC. Diabetes mellitus tipo 2 y su asociación con factores de riesgo cardiovascular en pacientes hipertensos. *Diabetes Internacional*. 2018;10(1):8-13.
18. Diaz CI, Calero AE, Jara AC, Fonseca MA, Quiroga SJ, Córdova VM, Sigüenza RM. Osteoartritis en pacientes con síndrome metabólico: enfoque preventivo. *Síndrome Cardiometabólico*. 2019;9(1):37-40.
19. Gualaquiza González R, Pérez Granja A, Tapia Caisaguano A, Legña Tibanta D, Bastidas Jiménez E, Gaibor Ortiz A, Bastidas Haro T, Allauca Yumiseba M, Bravo Bohórquez G, Miranda Buenaño F, Castañeda Morales D. Incidencia y características clínicas de lactantes menores con neumonía adquirida en la comunidad ingresados en el Hospital Pediátrico "Baca Ortiz", Ecuador. *Archivos venezolanos de farmacología y terapéutica*. 2020;39(4):260-3.
20. Keenan RT, Botson JK, Masri KR, Padnick-Silver L, LaMoreaux B, Albert JA, Pillingier MH. The effect of immunomodulators on the efficacy and tolerability of pegloticase: a systematic review. *In Seminars in Arthritis and Rheumatism* 2021 Apr 1 (Vol. 51, No. 2, pp. 347-352). WB Saunders.

