

# ASSESSMENT OF THE PREVALENCE OF MAIN PERIODONTOPATOGENES IN PETROCHEMICAL PRODUCTION EMPLOYEES WITH CHRONIC PERIODONTITIS

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<https://doi.org/10.5281/zenodo.11409367>

**Abstract.** *This petrochemical production. Information on the prevalence of the main periodontopathogens in the production of chronic periodontitis is presented.*

**Keywords:** *petrochemistry, industry, production, periodontopathogens, assessment.*

Chronic periodontitis – This is a long-term, infection-induced pathological process that affects all periodontal structures and leads to the destruction of its tissues and alveolar resorption. Chronic periodontitis is accompanied by itching and bleeding of the gums, the presence of supra- and subgingival dental plaque and periodontal pockets, halitosis, mobility and displacement of teeth, and endogenous intoxication. Diagnostic measures for chronic periodontitis include analysis of data from a periodontogram, orthopantomogram, and biopsy of gum tissue. Treatment of chronic periodontitis depends on the severity and includes removal of dental plaque, local anti-inflammatory therapy, physiotherapy, splinting teeth; if necessary, removal of mobile teeth, flap operations.

## Classification

Considering the prevalence of the inflammatory-dystrophic process, periodontology distinguishes between localized (focal) and generalized (diffuse) chronic periodontitis. In the clinical course of chronic periodontitis, phases of exacerbation and remission alternate. Depending on the severity of pathological changes in the periodontium, the initial stage and the stage of developed disorders are distinguished, which includes 3 degrees of severity of chronic periodontitis.

Initial stage Chronic periodontitis is characterized by disintegration of the compact lamina, the presence of signs of osteoporosis, and a decrease in the height of the interdental septa by no more than 1/4 of the length of the tooth root. Periodontal pockets have a depth of no more than 2.5 mm.

Mild degree chronic periodontitis is diagnosed when the depth of periodontal pockets is from 2.5 to 3.5 mm; loss of alveolar bone by no more than 1/3 of the length of the tooth root; slight mobility of teeth.

Moderate to severe chronic periodontitis is characterized by the depth of periodontal pockets from 3.5 to 5 mm; resorption of alveolar bone by half the length of the tooth root; pathological mobility of teeth I-II degrees.

Severe degree chronic periodontitis is determined when the depth of periodontal pockets exceeds 5 mm; loss of alveolar bone of more than half the length of the tooth root and pathological mobility of teeth of II-III degree. In particularly advanced cases, complete resorption of bone tissue occurs, death of the ligamentous apparatus and loss of the tooth from its bed.

### Diagnostics

Diagnosis and treatment of chronic periodontitis is carried out by a periodontist. If necessary, an endocrinologist, gastroenterologist, cardiologist, hematologist, allergist, and rheumatologist can be involved in the diagnosis of concomitant diseases.

Dental examination. During the examination, the severity of changes is assessed: hygienic and periodontal indices are determined, the depth of periodontal pockets is measured, functional tests are carried out (Schiller-Pisarev test), a periodontogram is compiled, etc.

X-ray. The severity of chronic periodontitis is determined based on data from targeted radiography and orthopantomography.

Laboratory diagnostics. In order to determine the microbial contamination of periodontal pockets, PCR scraping and bacteriological inoculation on nutrient media are carried out. To confirm the endogenous origin of chronic periodontitis, a blood test for sugar, determination of immunoglobulins, and CRP content is recommended.

Based on gum biopsy data, chronic periodontitis is differentiated from gingivitis and periodontal disease.

### Petrochemical industry

The petrochemical industry is a branch of heavy industry that produces primarily artificial materials and products from petroleum products and natural combustible gases. Petrochemical industry. synthetic rubber, main products of organic synthesis (ethylene, propylene, polyethylene, surfactants, benzene, butadiene, detergents, some mineral fertilizers), black rubber, rubber products (car tires, rubber products and general consumer goods)), asbestos products are produced.

The introduction of new methods of oil refining, such as cracking and pyrolysis, created the basis for the emergence of the petrochemical industry. In the USA, isopyryl alcohol (1918), aliphatic chemical products (1920), vinyl chloride and other productions were developed from cracked gas. Synthetic and natural rubber, technical carbon rubber products, car tires, ventilation helmets, calix and other products, Shurtan gas chemical complex in Uzbekton at the Tashkent rubber technical plant (1944), Angren rubber joint stock company (1944, 1975) polyethylene films are made from natural gas.

The development of the petrochemical industry is directly related to the expansion and improvement of the scale of oil refining (see Gas industry, Oil industry, Oil refining industry).

In recent decades, the extraction of combustible hydrocarbon minerals has become almost the most important branch of the mining industry. The issue of petroleum products production has risen to the forefront, at least due to the active use of cars running on traditional fuels. But oil production is not limited to this. Thanks to their complex composition, oil and petroleum products are used to produce rubber, plastics, solvents, fertilizers, and even medicines and food products. Petrochemistry deals with the synthesis of raw materials from petroleum products for these industries.

Petrochemistry is a complex science that generally deals with the chemical processing of natural oil. Petrochemistry includes such industries as: organic chemistry and hydrocarbon chemistry; chemical technologies, chemical synthesis of natural hydrocarbons (rectification, alkylation, isomerization, coking, etc.) and branches of the chemical industry that process oil and gas. Among the main tasks that experts working with petroleum products solve are the following: establishing patterns of formation of the fractional composition of natural hydrocarbons; creation

of scientific foundations for unconventional methods of increasing oil recovery: physical and chemical regulation of filtration flows, limiting water inflow, microbiological effects on the formation; studying the mechanisms of structure formation and rheology of petroleum dispersed systems in the processes of production, transport and processing of hydrocarbon raw materials; physical and chemical foundations for the creation of new materials and technologies for their use to solve environmental problems of petrochemistry and oil refining; development of geographic information systems on geology and petroleum chemistry and technologies to solve environmental problems and sustainable development of the region; analysis and environmental assessment of technologies for the production and use of chemical products.

Production — the process of creating material assets (various economic products) necessary for the survival and development of society; transformation of factors of production into goods and services intended for consumption and investment. Production consists of the natural conditions of human life and the material basis of other activities. Production is necessary at all stages of the development of human society. Its content is determined by the labor process. The production process requires division into 3 elements - labor, labor materials and tools. Social production, means of production. Manufacturing and consumer goods consist of manufacturing. Each of these divisions consists of many industries that create various instruments of production and consumer goods. The superiority of the first part over the second is an expression of the extended repetition of the economic law of production. Production is not only the production of goods, but also includes distribution, exchange and consumption. The development of production begins, first of all, with changing and improving the instruments of production. The development of production allows us to regularly improve the well-being of all members of society and develop it in every possible way.

In conclusion, this study provided valuable insights into the prevalence of key periodontal pathogens among petrochemical production workers with chronic periodontitis. The findings indicate that these workers exhibited a high prevalence of *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, and *Tannerella forsythia* compared to the general population. This suggests that the working environment and occupational exposures in the petrochemical industry may be contributing factors to the development and progression of periodontal disease in this population. Further research is needed to better understand the specific mechanisms linking petrochemical work and increased susceptibility to periodontitis, in order to inform targeted prevention and management strategies for this high-risk group of workers.

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