

Kopach K. D. Risk assessment and prophylaxis of work-related morbidity of dental staff in conditions of application of modern medical technologies. – Qualifying scientific work on the rights of the manuscript.

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In the dissertation one of the urgent tasks of modern health protection of Ukraine is solved – scientific substantiation of risk-directed measures of prevention of work-related morbidity of dental staff, in conditions of application of modern medical technologies.

The complex hygiene, medical-social, and epidemiological studies were based on the necessity to improve preventive measures for work-related and occupational pathology among dental staff in the health sector. The result was the establishment of medical-statistical and epidemiological patterns between the influence of harmful factors of working conditions and the emergence of work-related and occupational pathological conditions in the medical staff of the dental service which became the scientific basis for the substantiation of the system of prevention of dental staff morbidity in conditions of application of modern medical technologies. The undertaken research has indicated for the first time a number of facts and patterns which determine the scientific novelty of the obtained results.

For the first time, it has been found out that doctors-dentists (therapists, surgeons, orthodontists, orthopedists) and dental technicians in their workplace apply 230 means and materials that form 59 subgroups of chemical substances. It has been brought to light that the main factors that define harmfulness and hazard of the working conditions of dentists and dental technicians are: biological factors (HIV/AIDS, VHB, VHC, TB and others); (2) the nanodispersed dust ($d=5-100$ nm); the physical factors: illumination, noise, local vibration, microclimate, air ionization; labor severity and intensity.

It has been first established that the work activity of doctors-dentists and dental technicians is accompanied by the emission into the air of the work zone of nanosized particles ($d=5-100$ nm). According to the chemical composition, nanosized aerosols are represented by 14 elements (Si, As, Mg, Ca, Al, Pb, Ti, Cr, Mn, Fe, Ni, Zn, Ag, Cd), which belong to II and III groups of danger. At all the researched workplaces, the emission of nanoparticles into the air in the working area exceeds the recommended safe levels 2,0–2,4 times.

Nevertheless the part of workers have signs of psychopathological syndromes (% of employees): (1) occupational burnout (reduction of occupationalism – 45,4 %, depersonalization – 25,4 %, emotional exhaustion – 10,2 %); (2) depression (44,1 % including heavy form – 5,0 %); (3) stress resistance reduction (2,9 %)/

It has been defined that the incidence with temporary disability of the dental staff is "very low" (34.1 cases per 100 workers, 250.3 days per 100 workers, the average duration of one case is 7.3 days), mainly due to acute respiratory viral infections (52.0 %) and exacerbation (decompensation) of the existing chronic pathology (29.0 %). There is a significant excess of population levels in the disease spread among the workers for: the pathology of the upper respiratory tract (rhinitis, pharyngitis, laryngitis, etc.) (SIR=22.9); viral hepatitis B/C (SIR=16.1); radiculitis (SIR=10.7); bronchial asthma (SIR= 8.2); infertility (male) (SIR=7.6); tuberculosis (SIR=7.4); arthritis and arthrosis (SIR=6.0); pancreatitis (SIR=5.5); diseases of the thyroid gland (SIR=5.3) ($p < 0.001-0.05$).

It has been established that occupational factors involved in the emergence and progression of pathological conditions of the dental staff are the application of filling materials, alkali, metals, disinfectants, plastics, acids, medicines; the influence of ultrasound, ionizing radiation, noise, unfavorable microclimate; infectious patients' assistance, which is accompanied by industrial accidents; prolonged stay in an uncomfortable, forced posture, load and fatigue of the body, legs, arms, hands, shoulders, lifting and moving the loads; necessity of solving difficult tasks, heuristic (creative) activity, taking responsible decisions, work in conditions of time deficit ($p < 0.001-0.05$).

The complex of risk-directed measures of prophylaxis of work-related pathology of the dental staff is scientifically substantiated and based on the modern concepts of "Hazard prevention and control" and the strategy of "Industrial hygiene engineering controls" recommended by the ILO and WHO.

The efficiency of the use of dust reduction technologies (wet system of tooth tissue processing, sealing materials, orthopedic and orthodontic constructions etc.) and the application of sanitary measures (through aeration, wet cleaning of workplaces) has been proved which allows to significantly reduce the emanating concentration of dispersed nanoparticles and finely dispersed metal aerosols in air in the working area (from 1.8 to 3.8 times, $p < 0.001-0.01$).

The efficiency of using the filtering respirators with an exhalation valve (not less than the 1st and 2nd stages of protection) as an individual respiratory protection has been proved to ensure safe concentrations in the under-mask space of dispersion nano ($d=5-100$ nm) and small ($d=101-200$ nm) aerosols of metals (Ni, As, Cr, Mn, Zn, Ca, Al).

The program of secondary prevention of work-related and occupational pathology by conducting medical examinations of dental staff has been unified. It is based on a clear organizational algorithm and a modern evidence base for the detection of human pathological conditions and includes three stages: (1) screening; (2) early diagnosis; (3) differential diagnosis.

Key words: occupational health, risk factors, occupational pathology, work-related morbidity, prevention, medical staff, dentistry.