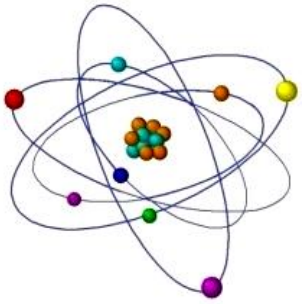
HEALTH PECULIARITIES OF THE EMPLOYEES IN INTERVENTIONAL MEDICAL CARE



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ABSTRACT: *According to the prognosis of WHO experts, ischemic heart diseases as well as cerebrovascular diseases in the world will occupy a prominent place among the ten leading causes of disease burden by 2030, which will further increase the number of people involved in the management of these pathologies as well as the number of employees in this field. Among the modern methods of the treatment of cardiovascular pathologies, interventional cardio therapy has achieved significant advancement in recent years. The purpose of the study was to determine the characteristics of health disorders of medical personnel employed in specialized procedures (coronary interventional cardiology). The objects of the research were: medical personnel working in coronary interventional cardiology and workers of cardiac catheterization laboratories of medical centers. The criteria for the inclusion of clinics in the study were: the presence of an interventional cardiology department, the smooth operation of the mentioned department during the last 3 years and involvement in the General Healthcare Programme with the emergency inpatient service. 56 employees of the catheterization laboratory were interviewed with the questionnaire prepared by us. Among them, 21 were interventional medical workers (all males), 11 were interventional assistants (all males), and 24 were catheterization laboratory nurses (9 females and 15 males). Factors of the work environment and work mode affect the health status of the employees. Among the interviewees, there was a high level of evidence of sensitization of the body, which was manifested in an increase in cases of the respiratory system and skin allergies (40% of the men (interventional workers: 58% 37-55-year-old; assistants: 26% 29-34-year-old; nurses: 16% 24-26-year-old age group representatives) and 48% of the women (interventional workers: 0%; assistant 0%; nurse 100% 28-35-year-old age group representatives). An increase in allergic reactions was noted (skin rashes in the form of small petechiae, burning and itching of the eyes, increased skin pigmentation, and allergic rhinitis were detected).*

Key words: interventional workers, factors of the work environment, allergic health effects

According to the frequency of development, diseases of the cardiovascular system have been in first place in the list of non-communicable diseases (NCDs) for years. Cardiovascular diseases are one of the main causes of death in all the countries of the world and account for about half of the deaths caused by noncommunicable diseases. According to experts, this number will reach 23.6 million by 2030 (Figure 1) [1].

More than 80% of these cases occur in middle- and low-income countries, where human and financial resources for healthcare are limited. According to the prognosis of WHO experts, ischemic heart disease will occupy a prominent place among the ten leading causes of disease burden in the world by 2030 (Figure 2) [1, 2]. In the structure of incidence of ischemic heart diseases in Georgia, angina pectoris accounts for almost half of the cases accounts for angina pectoris, the share of which has increased from 38.4% to 49.3%, while the rate of the share of myocardial infarction: 2.9% to 7.0% [5, 7].

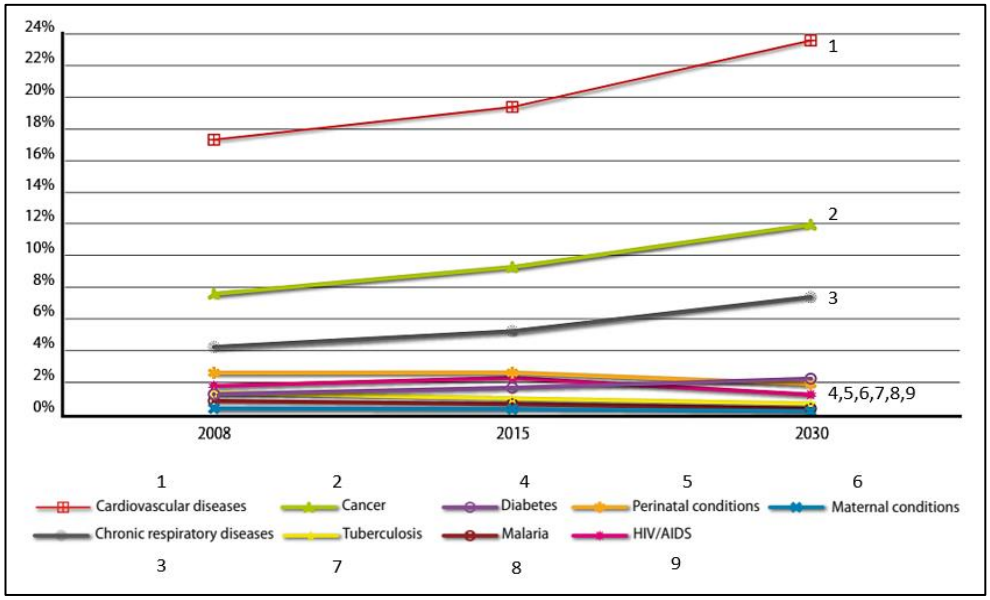

Fig.1. The projected mortality trends from 2008 to 2030 for NCDs, CVDs and communicable diseases (Global Atlas on Cardiovascular Disease Prevention and Control WHO)

2004 Disease or injury	As % of total DALYs	Rank	Rank	As % of total DALYs	2030 Disease or injury
Lower respiratory infections	6.2			6.2	Unipolar depressive disorders
Diarrheal diseases	4.8			5.5	Ischaemic heart disease
Unipolar depressive disorder	4.3			4.9	Road traffic accidents
Ischaemic heart disease	4.1			4.3	Cerebrovascular disease
HIV/AIDS	3.8			3.8	COPD
Cerebrovascular disease	3.1			3.2	Lower respiratory infections
Prematurity and low birth weight	2.9			2.9	Hearing loss, adult onset
Birth asphyxia and birth trauma	2.7			2.7	Refractive errors
Road traffic accidents	2.7			2.5	HIV/AIDS
Neonatal infections and other	2.7			2.3	Diabetes mellitus
COPD	2.0			1.9	Neonatal infections and other
Refractive errors	1.8			1.9	Prematurity and low birth weight
Hearing loss, adult onset	1.8			1.6	Birth asphyxia and birth trauma
Diabetes mellitus	1.3			1.6	Diarrheal diseases

Fig.2 Tenleadingcausesofburdenofdisease,world,2004and2030 (Global Atlas on Cardiovascular Disease Prevention and Control WHO)

In order to avoid the forecast made by WHO experts for 2030, in September 2015, the United Nations adopted the Sustainable Development Goals for 2016-2030, the third goal of which is related to health: "Ensure healthy lives and promote well-being for all age groups". Among the defined sub-goals, two are quantitative in nature, and one of them envisages a 1/3 reduction in mortality from non-communicable diseases [2, 3].

According to the prognosis of WHO experts, ischemic heart diseases as well as cerebrovascular diseases in the world will occupy a prominent place among the ten leading causes of disease burden by 2030, which will further increase the number of people involved in the management of these pathologies as well as the number of employees in this field. This implies the management of the working conditions as well as the work process of the employees and the detection of their possible health effects [2, 3, 9].

Among the modern methods of the treatment of cardiovascular pathologies, interventional cardio therapy has achieved significant advancement in recent years [4, 6, 8]. The main achievement of interventional cardio therapy is to reduce the period of post-procedural rehabilitation and to avoid the development of post-operative discomforts, such as pains and surgery scars as much as possible. Interventional cardio therapy is the "gold standard" for the treatment of acute myocardial pathology [6].

A coronary intervention involves restoring the patency of stenosed (narrowed) or occluded (clogged) blood vessels with a special endoprosthesis (stent). This procedure has significantly improved the condition of the patients. If years ago, heart surgery was often perceived as a process far more serious than the disease itself, today it is considered a simple and easy intervention. Stenting is not performed without a coronary angiography, because it depends on the findings of this study, whether the stent can be implanted in the stenosed or occluded section of the blood vessel or not. According to WHO recommendations, angiography of coronary arteries is recommended for patients with ischemic heart disease (IHD) [8].

With the improvement of cardiac catheterization techniques (which implies better radiographic equipment, a contrast with fewer side effects) and the introduction of effective methods of coronary artery disease treatment (coronary stenting, aortocoronary shunting (CABG)), diagnostic coronary angiography has become one of the most important components of cardiac catheterization. Every year, several million coronary angiograms are performed worldwide, and procedural lethality is only 0.1% [6, 7, 8].

The purpose of the study was to determine the characteristics of health disorders of medical personnel employed in specialized procedures (coronary interventional cardiology). The objects of the research were: medical personnel working in coronary interventional cardiology and workers of cardiac catheterization laboratories of medical centers. Adequate selection of medical centers was carried out at the initial stage in accordance with the aim and objectives of the research. The criteria for the inclusion of clinics in the study were: the presence of an interventional cardiology department, the smooth operation of the mentioned department during the last 3 years, and involvement in the General Healthcare Programme with the emergency inpatient service.

Taking into account the listed criteria, 14 medical centers were selected for the study (9 of them were multi-professional, and 5 were mono-professional), where sanitary-technical and sanitary-hygienic indicators were evaluated, which were compared with the relevant normative acts, and a survey of the working staff was conducted with a specially designed questionnaire.

Based on the timing of interventional medical workers' activities, it was revealed that one cycle of intervention lasts 45 minutes. From individual operations, the maximum time (10-10 min) is spent on antiseptics and anesthesia, as well as on hemostasis (by applying dressing and bandages), which is 22.2-22.2% of the total work cycle.

The average duration of coronary angiography takes 20 minutes, coronary stenting takes 30 minutes (the duration of the procedure depends on the anatomical features of the patient's coronary arteries and the number of stents required for placement). On average, 7 procedures are performed during a day: 4 coronary angiography and 3 stenting procedures.

Implantation of a pacemaker and a cardioverter-defibrillator (ICD) lasts 2 hours, the average number of which is 3-5 during a month (often a patient refrains from such intervention due to financial problems).

During the month, there were 5-6 calls to the interventional medical worker at night for the procedure. During the timing of the labor process, it was determined that the coronary study actually takes 20-40 minutes, and the stenting takes 40-50 minutes.

It is known that 0.05% of the patient's radiation dose is irradiated to medical personnel (exposed parts of the body) when wearing protective clothing. And the dosimeter, inside the lead jacket, records an additional 10% of 0.05%. The interventionist's assistant and support staff are irradiated with 30% of the amount of radiation of the operator [8].

During a study to find out if the medical personnel usually use personal protective equipment (to reduce radiation), it was determined that 98% of catheterization laboratory personnel do not use protective glasses; 67% of medical personnel do not attach the dosimeter to their body during the procedure; in most cases, it is not possible to determine closeness to the upper limit of radiation during the day, and subsequently, 98% of the personnel do not use a special radiation reducing shield during the procedure.

Factors of the work environment and work mode affect the health status of the employees. 56 employees of the catheterization laboratory were interviewed with the questionnaire prepared by us. Among them, 21 were interventional medical workers (all males), 11 were interventional assistants (all males), and 24 were catheterization laboratory nurses (9 females and 15 males). The average age was distributed as follows: interventional workers - 40.3 years, assistants - 32.1 years, catheterization laboratory female nurses - 28.5 years, and male nurses - 25 years. The average work experience in the interventional sphere of interventional workers was 10.3 years, interventionist assistants – 3.1 years, and catheterization laboratory nurses – 1 year.

To the question - "Has your health condition changed during the period of work in interventional medicine?" in 55% of cases the answer was negative, and in 45% of cases, we received a positive answer (diagram 1).

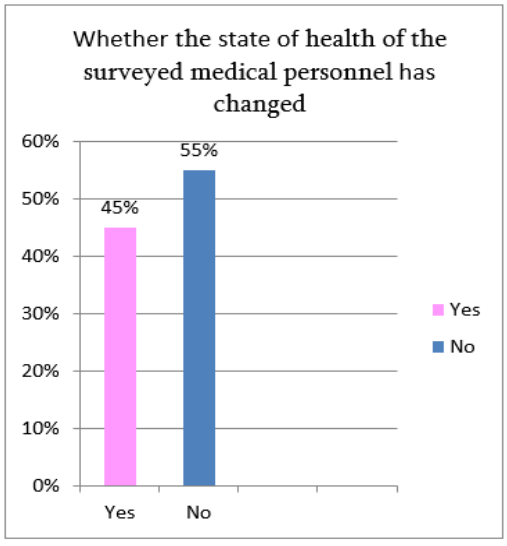

Diagram 1

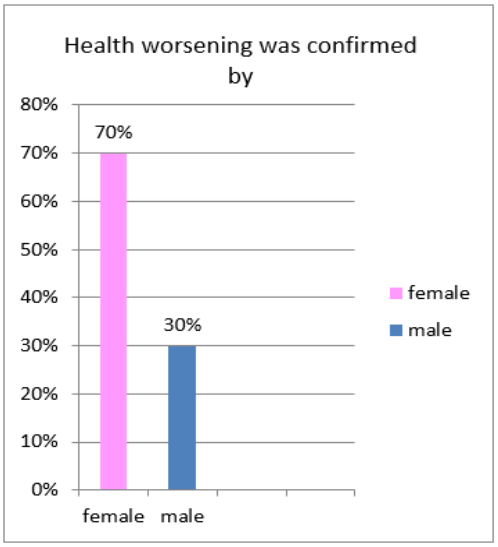

Diagram 2

Of 56 interviewed persons who reported deterioration of their health 70% were women, and 30% were men (diagram 2).

Further analysis of the data was conducted in the group of individuals with health effects.

Among the interviewees, there was a high level of evidence of sensitization of the body, which was manifested by an increase in cases of the respiratory system and skin allergies (40% of the men (interventional workers: 58% 37-55-year-old; assistants: 26% 29-34-year-old; nurses: 16% 24-26-year-old age group representatives) and 48% of the women (interventional workers: 0%; assistant 0%; nurse 100% 28-35-year-old age group representatives). It should be noted that depending on the

specifics of the professionals the correctness of the diagnoses recorded by the interviewees hardly raises any doubts.

An increase in the allergic reactions was noted (skin rashes in the form of small petechiae, burning and itching of the eyes, increased skin pigmentation, and allergic rhinitis were detected), which, in turn, was aggravated by the disorders of the ventilation system in 7-8% of the investigated clinics, the use of contrast substances during the procedures, the lack of adequate ventilation of the room. Also, the interior decoration of the clinic, made with low-quality building materials, created conditions for the sensitization of the body.

In general, clinic employees, not only catheterization laboratory staff, reported allergic reactions when they were in the clinic, while leaving the building the complaints were resolved. A positive exposure and elimination test was recorded, indicating the action of allergens in the workplace. It should be noted that there was no strict control over disinfectant solutions, which should have hypoallergenic ingredients.

We think that the complaints regarding immune system disorders were caused by the peculiarity of the interviewed medical personnel's activities. In particular, stress, irrationally distributed work process, disordered biorhythm (an average of 5-6 - night calls during a month), and presence of haptens/allergens in the workplace.

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