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**MANIFESTATION OF SOME KEY ISSUE ASPECTS OF FEATURES OF MEDICINES TURNOVER
AND ITS INFLUENCE ON ENVIRONMENT AND MEDICAL-ECOLOGICAL SAFETY CHALLENGES
GLOBALLY**

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**მედიკამენტების მიმოქცევის ზოგიერთი ასპექტი და მისი გლობალური გავლენა
ეკოლოგიაზე, ჯანმრთელობაზე და სამედიცინო ეკოლოგიურ უსაფრთხოებაზე**

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რეზიუმე

ფარმაცევტული საშუალებები აუცილებელია ადამიანის ჯანმრთელობისთვის, მაგრამ მათი გარემოში მოხვედრის შემთხვევაში იწვევს ეკოლოგიურ პრობლემებს, ეს ხდება მაშინ, როდესაც მოხმარების შემდეგ წამლის ნარჩენები გამოიყოფა ორგანიზმიდან ან გამოუყენებელი ფარმაცევტული საშუალებების არასწორად უტილიზაციისას. მიუხედავად იმისა, რომ არ არსებობს შემუშავებული მეთოდები ეკოსისტემაში შემავალი ყველა ფარმაცევტული ნივთიერების გამოსავლენად, ზოგიერთ ფარმაცევტულ ჯგუფს ეკოსისტემებზე უარყოფითი გავლენა აქვს, რაც იწვევს წყალში მობინადრე სახეობების სიკვდილიანობას და ცვლილებებს მათ ფიზიოლოგიაში, ქცევასა თუ რეპროდუქციაში. პრევენციული ღონისძიებები მოიცავს ფარმაცევტული საშუალებების რაციონალურ მოხმარებას, უფრო ეკოლოგიურად სუფთა წამლების დანიშვნას ან უვნებელი და ადვილად ბიოდეგრადირებადი ფარმაცევტული საშუალებების წარმოების განვითარებას, დაავადების პრევენციის გაუმჯობესებას, პერსონალიზებულ მედიკამენტებს, შეფუთვის გაუმჯობესებულ ზომებს და გამოუყენებელი ფარმაცევტული საშუალებების გადანაწილების ბაზარს. ძალიან საყურადღებოა წამლის ნარჩენების გარემოში შეღწევის თავიდან აცილება, ამიტომ გამოუყენებელი ფარმაცევტული საშუალებების სათანადო შეგროვება და განკარგვა ძალიან მნიშვნელოვანია.

Introduction: Currently, increasing attention is being paid to the presence and fate of active pharmaceutical ingredients, solvents, intermediates and raw materials that may be present in water and wastewater, including pharmaceutical wastewater. Traditional wastewater treatment methods, such as activated sludge, are insufficient to completely remove active pharmaceutical ingredients and other wastewater components from these waters. Pharmaceutical wastewater has direct and indirect impacts on the environment and health, especially near pharmaceutical industrial sites. Although pharmaceutical factories produce untreated or partially treated wastewater, drinking water sources are contaminated. Various classes of pharmaceutical compounds such as analgesics, antidepressants, antihypertensives, contraceptives, antibiotics, steroids, hormones, etc. were detected in water samples ranging from mg/L to µg/L. Although the quantities detected are very small, they are highly toxic to humans, animals and aquatic life. To protect the environment and lifestyles from health risks, the concentration of pharmaceutical compounds in medical wastewater entering drinking water sources should be regularly

monitored. This article highlights the toxicity, health risks, and environmental risk assessments associated with pharmaceutical contaminants [1,2].

Goal: Aim of the research was to study and analyzed study some key issue aspects of features of medicines turnover and its influence on environment and medical-ecological safety challenges globally.

Methodology: The material of the article was the data from scientific publications, which were processed, analyzed, overviewed and reviewed by generalization and systematization. Research studies are based on a review/overview assessment of the development of critical visibility and overlook of the modern scientific literature. use the following databases: (for extensive literature searches to identify study some key issue aspects of features of medicines turnover and its influence on environment and medical-ecological safety challenges globally). PubMed, Medline, Web of Science, Scopus, Web of Knowledge, Clinical Key, Tomson Reuters, Google Scholar, Cochrane library, and Elsevier foundations, national and international policies and guidelines.

Results and Discussion. The production and consumption of pharmaceuticals results in the presence of active pharmaceutical ingredients (APIs) in the ecosystem. Active ingredients enter the marine and terrestrial environment through release from manufacturing facilities, into wastewater after consumption of the drug in question, or through improper disposal of expired or unused drugs. The use of medicinal products in veterinary medicine may also result in the release of active substances into the environment, for example through the use of wastewater for irrigation, agriculture, aquaculture or the disposal of animal carcasses treated with veterinary drugs. The presence of APIs in the ecosystem can have a number of side effects, such as: Bacterial resistance to antibiotics and changes in the activity of digestive glands in marine life, reproductive toxicity in amphibians and feminization of fish. Another striking example of the impact of APIs on the ecosystem is the sharp decline in vulture populations due to the presence of diclofenac residues in cattle carcasses [3-4]. Demographic, epidemiological and lifestyle changes, such as the aging of the population, the increase in chronic diseases, the availability of cheap generic treatments and easy access to a large number of over-the-counter medications, have become key factors in the growth of the pharmaceutical industry. The global increase in drug consumption has led to greater international awareness of the problem of unused pharmaceuticals (UPs) in households and the harmful environmental and health consequences of their improper disposal. Drugs in the environment are challenging because they are designed to interact with a living system and produce a pharmacological response at low doses, making them dangerous to the environment even at low concentrations [5,6].

Pharmaceutical products enter the environment through two main routes: excretion and insufficient elimination. In both cases, pharmaceuticals end up in sewage treatment plants, which are generally not designed to remove these pollutants from wastewater. Drugs have been found mainly in surface water, but also in groundwater, soil, manure and even drinking water. The presence of drugs in freshwater and terrestrial ecosystems can lead to the release of drugs into wildlife with the possibility of bioaccumulation. People are then exposed to drugs through drinking water and their residues in crops, fish, dairy products and meat. The effects of pharmaceuticals entering aquatic environments are of increasing concern, with impacts ranging from molecular changes to population-level effects.

Pharmaceutical and personal care products (PPCP) in the environment are a hot topic. Veterinary antibiotics, prescription drugs and cosmetic products are discarded from a variety of sources and regularly enter the environment, where they occur in small quantities in wastewater, surface and ground water, silt-laden agricultural soils, aquatic and terrestrial biota, and wet drinks Water. The public should become

aware of this and is calling on the scientific and regulatory community to assess the potential risks to human health and the environment and take appropriate action if necessary.

The chemical pollutants such as pesticides, biocides or industrial chemicals, the release of pharmaceuticals into the environment must be regulated to ensure adequate information and transparency about the environmental impacts of pharmaceuticals; adequate and reliable assessment of environmental risks of pharmaceutical products; prevent pharmaceutical products from entering the environment throughout their entire life cycle and control releases of pharmaceuticals into the environment when prevention is not possible. Environmental pollution caused by pharmaceuticals is a complex public health problem that is scientifically controversial and affects multiple stakeholders with different interests and at different organizational levels: governments, non-governmental organizations, academic institutions, manufacturers, industries and families.

Conclusions: So after drugs enter the body, they are destroyed, neutralized, metabolized and converted into new compounds. Preventive measures include rational pharmaceutical consumption, prescribing greener drugs, or designing pharmaceuticals that are benign and easily biodegradable, improved disease prevention, personalized medicine, enhanced dimensioning of pack sizes, and marketplaces for redistribution of unused pharmaceuticals. The next step is to prevent unavoidable waste to reach the environment, so proper collection and disposal of unused pharmaceuticals is of utmost importance. Finally, educating health professionals and the public and partnership between environmental and healthcare scientists are of vital significance in all stages of the pharmaceuticals' lifecycle. Minimalization of the level of pharmaceuticals in the environment will benefit human life.

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SUMMARY

Aim of the research was to study some key issue aspects of features of medicines turnover and its influence on environment and medical-ecological safety challenges globally. Pharmaceuticals are essential for human health, but they become an environmental concern when entering the environment which occurs when residues are excreted after consumption or when unused pharmaceuticals are discarded improperly. Although there are no developed detection methods for all pharmaceuticals that reach the ecosystem, certain groups have been proven to cause adverse effects on ecosystems, including increased mortality in aquatic species and changes in physiology, behavior, or reproduction. Particular attention is devoted to these groups of pharmaceuticals and their environmental impact. Various policy interventions are recommended across the lifecycle including source-directed, user-orientated, and waste management measures, to prevent the creation of household pharmaceutical waste and to ensure environmentally friendly ways of pharmaceutical household waste disposal. Preventive measures include rational pharmaceutical consumption, prescribing greener drugs, or designing pharmaceuticals that are benign and easily biodegradable, improved disease prevention, personalized medicine, enhanced dimensioning of pack sizes, and marketplaces for redistribution of unused pharmaceuticals.

Keywords: Features, medicines, turnover, influence, environment, health, ecological safety

