Poster session

Safety of use of raw materials and plant products

Chairs:

Professor Irena Matławska, PhD habilitated in pharmaceutical sciences

Andrzej Ostrowicz, PhD in pharmaceutical sciences

Marcin Ożarowski, PhD habilitated in pharmaceutical sciences, professor at the IWNIRZ-PIB

22. Interactions of *Ginkgo biloba* with synthetic drugs

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23. Interactions of St. John's wort with synthetic drugs

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24. Herbal food supplements for seniors - composition and safety of use

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25. Pharmacopoeial plant materials used in the prevention and treatment of liver damage

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26. Philosophical approach to phytotherapy

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22. Interactions of *Ginkgo biloba* with synthetic drugs

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Introduction. *Ginkgo biloba* leaf extract is mainly used to improve concentration and cognition. In addition, it is also recommended in intermittent claudication and tinnitus, dizziness of vascular origin. Its beneficial effect is observed in the treatment of obesity, hypertension and lipid disorders [1,2].
It has the beneficial effect on the circulatory system, mainly on blood flow, dilating blood vessels and a decrease in blood viscosity, positive effects on the conductivity in the nervous system as well as anti-radical properties. Probably it inhibits the process of amyloid deposition and the development of neurodegeneration [3,4]. However, it may also be associated with a doubling of the risk of haemorrhagic [5].
Material and methods. A literature review from 2006-2021 mainly on PubMed based on the following keywords: *Ginkgo biloba*, interactions, synthetic drugs.
Results. Although preparations of ginkgo biloba extracts are generally well tolerated, special attention should be paid to patients treated with anticoagulants. This includes, patients with cardiological diseases such as atrial fibrillation, ischemic heart disease, patients with venous thrombosis, pulmonary embolism, patients who are immobilized for a long time, with a plaster cast or orthopedic orthosis, after cardiac surgery, with cancer. *Ginkgo biloba* extracts may impair the ability of platelets to aggregate by inhibiting the platelet activating factor (PAF). Increase the risk of bleeding if used in combination with vitamin K antagonists (warfarin, acenocoumarol) or other antiplatelet agents (acetylsalicylic acid, clopidogrel, ticagrelor) [6]. Preparations of *Ginkgo biloba* extracts may increase the effect of drugs metabolized by liver, including diuretics, paracetamol, non-steroidal anti-inflammatory drugs, and some antidepressants (trazodone). On the other hand, it reduces the effect of proton pump inhibitors (omeprazole) [7].
Conclusions. Using supplements without consulting a doctor increases the risk of serious interactions with prescribed drugs. Increasing the awareness of the risk of serious consequences of self-medication is an important element of the therapy of patients, especially the elderly. It is also important to educate doctors about the interaction of herbal preparations with prescribed synthetic drugs.
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23. Interactions of St. John's wort with synthetic drugs

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Introduction. St. John's wort (*Hyperici herba*) is a medicinal plant known for a long time. It is characterized by a diversified therapeutic potential, thanks to the numerous compounds it contains, which, on the other hand, may have an influence on the occurrence of serious interactions with synthetic drugs.

Material and methods. Literature review from 2004-2021 mainly on PubMed based on keywords: St. John's wort, interactions, synthetic drugs

Results. St John's wort may cause undesirable interactions with drugs metabolized by cytochrome P450 isoenzymes and substrates for P-glycoprotein (P-gp). Mainly, hyperforin activates cytochrome P450 isoenzymes in the liver and intestinal mucosa, as well as increases the activity of P-glycoprotein, and therefore affects the pharmacokinetics of various drugs (accelerates their elimination from the body, reduces plasma concentration and weakens the therapeutic effect) Such an interaction is noted in the case of concomitant use of St. John's wort preparations with the following drugs: antiretroviral drugs (ie amprenavir), which leads to an increase in HIV viral load; immunosuppressants (cyclosporine, tacrolismus), which significantly increases the risk of transplant rejection; anti-cancer drugs (imatinib, irinotecan, docetaxel), which increases the risk of developing cancer, anticoagulants increasing the symptoms of thrombosis; oral contraceptives, which reduces their effectiveness. In addition, pharmacokinetic interactions, through induction of CYP3A4, CYP2C9, CYP2C19, P-gp, occur with the use of preparations of St. John's wort with amitriptyline, atorvastatin, benzodiazepines, digoxin, phenytoin, fexofenadine, finasteride, gliclazide, matinibadine, clapinopogrelem, and nifedipine, omeprazole, rosuvastatin, simvastatin, talinolol, theophylline, thyroxine, verapamil, voriconazole, which in this case requires monitoring of therapy [1,2,3,4]. Clinical studies also show that St. John's wort has pharmacodynamic interactions with other drugs. Using it together with paroxetine, sertraline, clomipramine, nefazodone, trazodone, tramadol may result in the development of serotonin syndrome, and with citalopram and anti-migraine drugs (zolmitriptan, sumatriptan) - an increase in side effects [5,6].

Conclusions. The use of many synthetic drugs by patients, especially in old age and very often additionally as part of self-treatment, without consulting a doctor, increases the risk of serious interactions between them. Patients need to be educated about the dangers of interactions between herbal drugs and synthetic drugs.

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24. Herbal food supplements for seniors - composition and safety of use

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Introduction. Food supplements have been of great interest to various groups of consumers for many years. The aging population requires a comprehensive look at the health aspects of their lives. Older people usually have a number of chronic conditions that cause various ailments that reduce the comfort of life. The elderly often suffer from hypertension, ischemic disease, osteoporosis, diabetes, chronic obstructive pulmonary disease, hypercholesterolemia, digestive problems. In addition, they also suffer from vision deficiency, hearing loss, incontinence, insomnia, weakness, low mood, sadness and depression. In seniors, many of the ailments mentioned occur simultaneously, leading to polypragmasia. The elderly also use various food supplements, very often without sufficient knowledge of their composition and possible side effects. These products, taken under the influence of commercials and without the knowledge of doctors, may interact dangerously with medicinal products.

Materials and methods. In-depth analysis of food supplements offered at pharmacy outlets, well-known drugstore chains and online stores (50), check of the composition of products reviewed by the IWNiRZ-PIB (60) and public warnings about food supplements (10).

Results. Food supplements for seniors offered on the market include products that support the proper functioning of the heart and circulatory system, immunity, digestive system, contain herbal materials for lowering glucose levels and cholesterol, are recommended for the prevention of constipation, support hydration of the body. Food supplements aimed at the elderly usually contain the following plant parts: ginseng root, ginkgo biloba leaf, turmeric rhizome, peppermint extract or leaf, dill fruit extract, anise fruit extract, artichoke leaf, aloe vera juice, rosehip extract, hawthorn blossom or hawthorn fruit extract, soy lecithin, as well as vitamins, mineral compounds and fiber.

Conclusions. The main problems associated with food supplements for seniors are the difficulty in determining the safe dosage of the active substances used, the disordered presence of ingredients other than vitamins and minerals in food supplements, the low quality of herbal preparations, adulteration of the composition, the presence of hazardous (e.g., ethylene oxide) or limited substances, potential interactions with medications that seniors take on a regular basis due to multi-disease. Unregulated issues regarding the safe use of food supplements among older consumers require urgent corrective action. It is essential to continuously educate this vulnerable group of consumers about the dangers of uncontrolled consumption of food supplements.

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25. Pharmacopoeial plant materials used in the prevention and treatment of liver damage

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Introduction. Drug-induced liver injury (DILI) is a significant geriatric problem. Plant materials are an effective way to counteract and support the treatment of liver damage.
Materials and Methods. The literature research was limited to publications in Polish and English until September 2022 and conducted using scientific databases such as PubMed and Scholar. The search terms included: "hepatoprotective effect", "medicinal plants" and "natural compounds".
Results. Silymarin, from the hulls of milk thistle fruit (*Silybi mariani fructus*), is the most clinically tested compound against liver damage. It's a flavonolignan complex that includes: silibinin, isosilibinin, silichristin and silidianin [1]. The hepatoprotective effect of silymarin is due to (i) the ability to neutralize free radicals resulting from the metabolism of toxic substances and maintain a high level of endogenous antioxidants - SOD and GPx, (ii) maintain the integrity of hepatocyte membranes and inhibit the penetration of toxins into the liver cells, (iii) increasing protein synthesis in hepatocytes by stimulating the synthesis of ribosomal RNA, (iv) preventing liver fibrosis by reducing the multiplication of stellate cells [2,3]. It has been shown that silymarin has a protective effect on the liver in intoxication with *Amanita phalloides*, psychotropic drugs, paracetamol and alcohol in daily doses 280-800 mg, which corresponds to 400-1140 mg of the standardized extract [1]. On the other hand, extracts from artichoke leaves (*Cynarae folium*) and turmeric rhizomes (*Curcumae longae rhizoma*) are key ingredients of plant preparations that improve liver function, mainly to increase bile secretion and bile acid production [4,5]. Their hepatoprotective activity is related to a strong antioxidant potential resulting from the presence of phenolic acids (chlorogenic acid and cynarin) and curcuminoids (curcumin), respectively [6,7].
Conclusions. Milk thistle fruit, artichoke leaf and turmeric rhizome are used as components of functional foods or plant preparations to restore the physiological functions of the liver.
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26. Philosophical approach to phytotherapy

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Introduction. The basic task of primitive man, which was prompted by his self-preservation instinct, was to survive. To survive, he had to satisfy his hunger. Getting food was not an easy task. Initially, it consisted in collecting fruits, herbs and roots, later, thanks to the acquisition of skills by man, hunting made it possible to satisfy this need. In search of food, primitive man also accidentally consumed plants that had unintended effects on him, such as pain relief, quick wound healing, laxative and emetic effects, causing disease or even death. Noting these phenomena in his memory, man passed these experiences (empiries) to the next generations as guidelines and warnings.
Material and method. The literature was reviewed, mainly the available textbooks were used.
Results. In this way, herbal medicine was born, which over time began to be dealt with mainly by women. On the basis of experience and the transferred knowledge, they were able to heal the sick, poison the healthy and even cause his death. Since it was impossible to explain the extraordinary, secret power of herbs, they began to be considered magical, and women who used herbs as grandmothers, healers or shamans. People gaining experience in the use of plants began to associate their appearance and shape with the disease for which they were applied. Beans were used in kidney diseases, hepatica leaves in liver diseases, saffron in the treatment of jaundice, poppy seeds for headache, colic plants were treated with spiny plants. Especially believed in the healing power of mandrake root, which resembles a human figure, therefore it was used in the treatment of all diseases. On the European continent, the origins of medical knowledge go back to ancient Greece. The works of Homer illustrate well the knowledge of herbal treatment of the time. In the Iliad, the warrior Achilles has a wound with a yarrow herb (Achillea). In The Odyssey Helena, the daughter of Zeus poured opium into the wine, which made it forgetful and soothed pain and physical suffering. In Greek mythology, herbs also played a role. Demeter knew about the properties of the poppyseed she took to forget about the pain. Panacea, the daughter of Asclepius' first physician, healed with herbs. The last and greatest figure of ancient times who influenced the development of herbal medicine was Galen, who believed that plants should be learned in their natural environment. Therefore, he traveled far to collect rare plants. With the development of Christianity in medieval Europe, the monks developed their own recipes, drawing on the experience of ancient medicine contained in the books prescribed by the Benedictines. The Brothers took care of the sick, the Cistercians grew herbs in their gardens, and their herbariums are still a source of knowledge about herbal medicine.
Conclusions. From the experience of a man learning about the properties of herbs, phytotherapy was born, which today is part of medical knowledge and pharmacology. Many studies confirm the effectiveness and safety of the use of herbs in various ailments.
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