
THE USE OF NAPHTHALAN IN MEDICINE

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Abstract

The article describes curative features of naphthalan, the unique oil obtained in Azerbaijan. Naphthalan was obtained manually till late 19th century. In 1890 Eger, the German engineer prepared the equipment for industrial obtainment of this oil. This way naphthalan become known in Europe where it had been used in pharmacy and medicine. "Naphthalan" resource was founded here in 1926 and over 2000 fundamental scientific researches have been held so far concerning naphthalan which proved own efficiency against several diseases.

Key words : Naphthalan, Naphthalan-based Ointments, Naphthenic Hydrocarbons, Native Naphthalan Oil, Naphthalan Application, Naphthalan Therapy, Deresined Naphthalan.

Naphthalan is an Azerbaijani word meaning "a place where there is oil". This is the name of a city located 320 km west of the Azerbaijani capital Baku and 50 km south-east of ancient Ganja. According to archive data, Naphthalan was extracted manually from shallow depths until 1873. In 1890, German concessioner E. Eger bought a piece of land here and established first 250-m wells to start commercial production of oil. After learning about the broad medicinal use of Naphthalan and finding out some of the treatment techniques from the local population, he built a small factory to produce ointments from the non-combustible oil [6]. The business proved very successful, while factory products, as well as the raw materials, were exported to Germany where two joint-stock companies, "Naphthalan in Magdeburg" and "Naphthalan in Dresden", were launched in 1896. The companies were producing medicines from the Naphthalan oil. The Dresden-based firm also issued a guidance on the application of naphthalan, which, in addition to Eger's articles, contained over 600 reviews from doctors [12]. The recipes of Jaeger's ointments were kept secret, while the ointments proper were widely advertised in many countries as a miraculous remedy for almost all diseases. Curiously enough, during the Russo-Japanese War of 1904-1905, Japanese soldiers had a Naphthalan ointment with them, which was prescribed for the treatment of wounds and burns [4].

The Naphthalan ointment was applied not only to medicine but also to cosmetology. In 1900-1902, beauty shops in Paris widely used different preparations made from Naphthalan. It was mostly used as a basis for ointments [10,15]. In 1899, *Pharm Zeitung magazine* published 65 composition formulas of ointments, pastes, plasters, suppositories, soaps, powders, etc., all based on Naphthalan. Over a short period of time, the demand for Naphthalan and various drugs made from it significantly increased in

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Europe. From the late 19th century, Naphthalan-based ointments were exported to Russia as a patented German product [4,7].

In 1920, the Naphthalan deposit was transferred into the jurisdiction of the Soviet Union and declared a protected zone. In 1926, a specialized resort Naphthalan began to operate there, providing treatment to patients from all over the Soviet Union suffering from musculoskeletal, neurological, skin, gynecological and urological diseases. Subsequently, in 1938, an experimental laboratory for the study of biological effects of Naphthalan was established at the Baku Institute of Health Resorts.

In 1941, the Pharmacopoeia Committee of the USSR People's Commissariat approved the production of refined Naphthalan : the native (natural) Naphthalan dehydrated by way of heat treatment at a temperature of 125-135°C. It served as a basis for the Naphthalan ointment widely-known in the USSR. Later on, the Galen chemical and pharmaceutical factory in Moscow produced over 30 types of Naphthalan-based drugs. The total number of Naphthalan-based drugs exceeds 200 : deresined naphthalene, therapeutic putty, salicyl Naphthalan cream, boron-zinc-Naphthalan paste, Naphthalan phytoncide emulsion, Naphthalan oil, etc. Thus, in addition to recreational therapy of Naphthalan, a town visited by more than 80,000 people from all over the former USSR every year, Naphthalan has been widely used in medical practice.

So what underlies its medicinal qualities ?

The study of the chemical and physicochemical properties of Naphthalan was undertaken by the Academy of Sciences, various departments of the Azerbaijan State Medical University, the Institute of Experimental Medicine of the USSR Academy of Sciences [1,5,14]. A significant contribution to the study of Naphthalan has been made by such illustrious scholars as Y. Mamedaliyev, K. Yegorov, A. Garayev, T. Pashayev, K. Krasusskiy, S. Hasanov, M. Nevyadomskiy, A. Babayev, N. Aliyev, etc.

Naphthalan is a naphthenic oil. In appearance it hardly differs from conventional industrial oils. However, in contrast, it has a high specific weight (from 0.927 to 0.970) and contains a significant amount of resin (25-30 per cent), naphthenic (from 50 to 60 per cent) and aromatic (15 per cent) hydrocarbons. According to scientists, it is naphthenic hydrocarbons that precondition its therapeutic properties [1,8,14]. Such hydrocarbons form the basis of many biologically active substances (sterols, bile acids, vitamin D, progesterone). They also participate in biosynthesis reactions of steroid hormones. Naphthalan also contains a large number of physiologically active microelements, such as zinc, boron, manganese, iodine, copper, lithium, rubidium, cobalt, molybdenum, etc., which certainly plays a role in medicinal effects. Also biologically active is the nitrogenous basis of Naphthalan, as well as naphthenic acids [1,5].

The first official report on the application of Naphthalan for therapeutic purposes was made in Russia in 1896. At a meeting of the Caucasus Medical Society in Tiflis, Doctor F.G. Rosenbaum said he had applied it to burns, acute and chronic eczema, seborrhea, psoriasis, wounds, sprains and rheumatic pains. According to him, Naphthalan accelerates the scarring process, has an antiseptic and anti-inflammatory effect. In 1898,

Moscow Dermatological Society recognized the findings of well-known scientist A. Pospelov published in journal *Physician*. He used Naphthalan oil in dermatology and confirmed its healing properties [4,6].

Most clinical researches focus on studying the possible application of Naphthalan to the treatment of rheumatic diseases of the joints. It has been established that the correct application of the Naphthalan therapy helps reduce inflammation of the joints in patients suffering from rheumatoid and psoriatic arthritis [2,6]. The effectiveness of Naphthalan in combination with ultraviolet irradiation has also been established. According to scientists, this is achieved due to the anti-inflammatory, analgesic and immune-modulating effects of Naphthalan. Naphthalan applications have proved to be an effective means of prevention of spinal deformity (Ankylosing spondylitis) as well [5,7]. After therapy, patients observed a decrease of reflex muscle tension and an increase in the range of motion in the spine.

A differentiated application of Naphthalan in the form of two- or four-chamber baths is recommended in the treatment of peripheral vascular diseases : obliterating atherosclerosis, endarteritis, post-thrombophlebitic syndrome and diabetic angiopathies of vessels of lower extremities, which is explained by its vasodilator and anti-inflammatory effect. The selection of this method of treatment depends on the form and stage of the disease and individual characteristics of the patient. In addition, attention should be paid to cardiac activity, blood pressure and cerebral circulation.

The Naphthalan therapy is prescribed to women for the treatment of inflammatory diseases in their chronic and sub-acute stages. The best results have been achieved in the treatment of chronic nonspecific salpingo-oophoritis, primary and secondary infertility. Naphthalan is applied in the form of swabs, lubrication and gauze trailers. Used for this purpose is deresined Naphthalan, which is first sterilized [5].

Local lubrication, both as mono-therapy and in combination with ultrasound therapy (phonophoresis) or infrared-ultraviolet radiation, have shown high efficacy in patients with dorsopathy of the cervical and lumbar spine in the sub-acute stage, the stage of incomplete remission and remission. Naphthalan helps significantly decrease the severity of pain, restore the motor function and improve peripheral vascular blood flow [5,6,9].

First information on the effective use of Naphthalan in the treatment of eczema, psoriasis, pruritus, burns and other skin lesions appeared in the periodical medical literature more than 100 years ago [11]. According to many dermatologists, the Naphthalan oil applied to patients with psoriasis, neurodermatitis and eczema helps reduce pain and tightness of the skin, and leads to its softening and regeneration [3,13].

Both native Naphthalan oil obtained from wells and its various derivatives, such as refined Naphthalan, deresined Naphthalan oil (a mixture of aromatic and naphthenic hydrocarbons), naphthenic hydrocarbons (cleared from admixtures), external preparations containing refined Naphthalan or its components (Naphthalan paste, liniment of the Naphthalan oil, the Naphthalan ointment, etc.), are used for therapeutic purposes. There are numerous techniques of the Naphthalan application : general baths, lubrication and application, combination of the Naphthalan therapy with various methods of physiotherapy, etc.

The Naphthalan oil has no analogues in the world. It still arouses a great deal of interest from academics, doctors and patients around the world. At present, the Azerbaijan Institute of Medical Rehabilitation and Natural Medical Factors, the Russian Scientific Center for Restorative Medicine and Health Resorts, and other research centers are studying the biological and therapeutic effects of Naphthalan at the modern methodological level. In recent years, Naphthalan has been extensively studied and applied to clinical practice in Russia, Germany, USA, Ukraine and other countries. The Naphthalan resort is also being revitalized.

More than 100 years have passed since a systematic study of medicinal properties of Naphthalan was launched. Its efficacy in the treatment of various diseases has been confirmed by over 2,000 research papers, theses and monographs.

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