4. ASSESSMENT OF THE IMPACT OF TEMPERATURE ON THE VISCOSITY OF THE COMBINED EAR DROPS

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Introduction. In the development of ototopic formulations, physicochemical factors such as solubility, viscosity, tonicity, surfactant properties, preservatives, impregnation capacity, ceruminolytic and diffusion activity play a very important role. Thus, auricular drops may contain excipients to adjust viscosity, adjust or modify pH, increase solubility of active substances or stabilise the preparation. The viscosity of a topical formulation is important because of the effect it has on the ability to effectively release the active substances at the site of administration. Temperature is a key factor in maintaining the stability, bioavailability and efficacy of auricular drops. Temperature variations in the process of storage and use of the ototopical pharmaceutical form can influence its physical parameters.

Aim of study. To study the influence of temperature on the viscosity values of combined isohydrofural and methyluracil ear drops.

Methods and materials. The Fungilab Smart R rotary viscometer was used to investigate the viscosity. The viscosity of the droplets was determined at 10 rotational speeds at temperatures of 25 and 37°C.

Results. Optimal viscosity ensures prolonged contact time with the ear surface and prevents droplet leakage. The choice of solvent in the process of ear drop development is reasoned by the type of treatment and application site. In the case of infection of the external auditory canal, the use of non-aqueous solvents is recommended. The investigated formulation contains PEG-400 and propylene glycol, the latter has advantages, being less hygroscopic and poorly oxidizable, retains preservative properties at 15% concentration. The viscosity of the auricular drops was evaluated at temperatures of 25°C (t. at storage) and 37°C (t. at the administration site). The viscosity values at shear rate 0.3 RPM were: at 25°C - 27.247 P·102; at 37°C - 25.151 P·102. By plotting the rheograms of the dependence of viscosity and shear stress on shear rate, the non-Newtonian and pseudoplastic character of the droplets was demonstrated (viscosity of liquids decreases with increasing shear rate).

Conclusion. It was determined that at a concentration of 60% PEG-400 and 20% propylene glycol, the values of viscosity and shear stress at the lowest shear rate decrease with increasing temperature, but remain within acceptable limits to ensure optimal contact time with the ear surface.