High Performance Liquid Chromatography to quantification of hydroquinone on manipulated creams in Araraquara/SP

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Introduction

Hydroquinone (HQ) is a depigmentation agent used in creams and has as function the inhibition of melanin production. Its use is indicated to skin whitening, and it is effective in the range of 1.5 a 5%. As adverse effects, it can cause redness and burn, mainly when it is in high concentrations. Its chemical instability is an inconvenience to its use, because it is easily oxidized and its product of oxidation, the benzoquinone, does not have therapeutic effect. The aim of this work was analyze manipulated creams containing hydroquinone 2% in Araraquara/SP, using the method of High Performance Liquid Chromatography (HPLC).

Results and Discussion

Were acquired manipulated creams containing the 2% HQ in 4 pharmacies of Araraquara/SP to check their quality using the HPLC method. The mobile phase used was acetonitrile and water (75:25 v/v) at pH 2.1 (adjusted with fosforic acid); column LC (Lychrispher 100 A° RP18-C18, 250 x 4,6 mm, 5 μm) at the temperature of 25° C; flow of 1 ml.min⁻¹ and injection volume of 20 μL. The fixed wavelength on detector was 293 nm. And the mobile phase was used as diluent. The concentration of the standard and the samples was 18μg/mL. The figure 1 shows the results of the standard obtained of 4 formulations.

![Figure 1 – Hydroquinone’s content on manipulated creams obtained in Araraquara/SP](image)

All the samples were analyzed in duplicate and showed standard deviation below 1%, indicating the accuracy of the methodology.

The samples A e B are not in accordance with the specification of HQ creams described at USP 35, that recommends the content between 94 and 106%. In addition, the sample B showed changed aspect (pink coloring), indicating oxidation, probably, of the raw material. And also, it was the sample with highest content of HQ, which means it was incorporated more active than allowed without prescription.

The formulation is the only valid for 3 months, and the others, the validity is 2 months. On the date on which we made the analysis of the sample, it would be already past due for 8 days if consider the validity of 2 months, what could justify its low content.

Conclusions

The creams provided by the pharmacies of the study showed variation in amount of hydroquinone, what means the lack of standardization and control in production process. To avoid this problem, would need to be incorporated into the pharmacies quality tests that ensure stability of formulations and, consequently, certify its therapeutic efficacy and safety of consumer.

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3 FUNARI A. P. Controle de qualidade comparativo de gel de hidroquinona referência e similar. 2011. Trabalho de Conclusão de Curso (Bacharelado em Farmácia) - Universidade Feavele, Novo Hamburgo, 2011.