Robustness of Palm Kernel Oil Blend in Suppository Preparation Using Acetaminophen as a Model Drug

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BACKGROUND: Theobroma oil suppository base has good characteristics for the delivery of most drugs, but its polymorphism renders it a difficult medium with which to work. Preparation of suppositories using theobroma oil must be carried out at a temperature below 36°C to avoid formation of metastable polymorphs. Substitutes for theobroma oil are therefore desirable.

OBJECTIVE: To compare the characteristics of theobroma oil- and palm kernel oil blend (PKOB)-based suppositories, each produced by 2 different techniques of preparation.

METHODS: Theobroma oil and PKOB (consisting of hydrogenated palm kernel oil and hydrogenated palm kernel stearin in an 8:2 ratio, with 5% stearic acid and 5% glyceryl monostearate) were used as a base. Suppositories were prepared by 2 different techniques, with acetaminophen used as the model drug. The standard technique used a water bath to melt the base preparation at 38°C before incorporation of acetaminophen, while the second technique involved melting the base in an oven at 60°C. The 2 types of suppositories produced by these techniques were then tested physically for appearance, hardness, liquefaction time, and melting characteristics using differential scanning calorimetry.

RESULTS: Satisfactory theobroma oil–based suppositories were produced by the water bath technique at 38°C, but the oven technique at 60°C failed to produce a good product. On the other hand, both techniques produced satisfactory PKOB-based suppositories that were similar in both physical and thermal characteristics.

CONCLUSIONS: PKOB constituted with the above-mentioned ingredients can be exposed to a wider range of temperatures without risk of polymorphism.


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