

Assessment of Compliance with Instructions for Administering Medicinal Dry Syrups to Infants (2)

Survey of Acceptability of Theophylline Dry Syrup and Evaluation of Stability of Theophylline after Admixture with Various Diluents

Minae Isawa¹⁾, Takahiko Koizumi¹⁾, Satomi Horieya¹⁾, Miwako Kobayashi²⁾,
Masataka Mochizuki³⁾, Emi Nakashima^{1)*}

1) Department of Pharmaceutics, Kyoritsu College of Pharmacy, 1-5-30, Shibakoen, Minato-ku, Tokyo

2) Kuji Clinic, 4-5-7 Kajino-cho, Koganei-shi, Tokyo

3) Department of Organic and Bio Organic Chemistry, Kyoritsu College of Pharmacy, 1-5-30, Shibakoen, Minato-ku, Tokyo

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Abstract :

Purpose : Refusal of oral medicinal drugs by infants is a considerable problem for their mothers. We conducted a questionnaire survey to assess the acceptability to infants of various medicinal dry syrups alone or mixed with various fluids, in order to estimate compliance.

Methods: The questionnaire prepared asked 48 mothers with sick infants whether the medicine being mixed with a favorite fluid improved infant acceptability, whether such a mixture was recognized as medicine by the infant, and also asked about their method of storage of such medicine/-fluid mixtures. We examined the stability of medicine in various medicine/fluid mixtures. We chose Theodur[®] dry syrup and 3 fluids (orange juice, yogurt and ice cream) as potential masking agents. We also examined the effect of freezing Theodur[®] dry syrup, ice cream and water mixtures at -20 for 8 and 24 hours. In order to determine theophylline loss in water-diluted ice cream, ice cream was diluted 10-, 100- and 1000-fold with water, mixed with Theodur[®] dry syrup, and frozen for 8 or 24 hours. In order to evaluate the dissolution characteristics of theophylline from the medicine, theophylline concentrations in Theodur[®] dry syrup/water mixtures were measured at intervals for up to 24 hours. This time course measurement was done for samples without storage and after freezing at -20 for 24 hours.

Results : Most of the mothers replied that they mixed the medicine with the infants' favorite fluid. Fifty-two percent of the mothers were concerned that the effectiveness of the medicine might have been reduced by mixing. When they failed to completely administer the mixture, most of the mothers discarded the mixture, but 24% of them kept the mixture in the refrigerator. Theophylline in Theodur[®] dry syrup/fluid mixtures was measured by high-performance liquid chromatography after refrigeration of the mixtures at +4 for 8 hours. There was no change in the theophylline concentration of Theodur[®] dry syrup/fluid mixtures after 8 hours. The only exception was for the medicine/ice cream mixture after 8 hours freezing; the theophylline concentration was reduced to 94%. However, Theodur[®] dry syrup/water mixture lost 45 % of the medicine after 8 hours of freezing. When dissolution ratios of theophylline in solution were compared in samples without storage and after 24 hours freezing at -20, the frozen samples showed reduced concentrations.

Conclusions: Most mothers mixed medicine with the infant's favorite fluid in order to get better compliance from the infant patients. The effect of mixing the medicines with such fluids should be objectively examined.

Keywords : infant, stability, freezing, dissolution, theophylline