

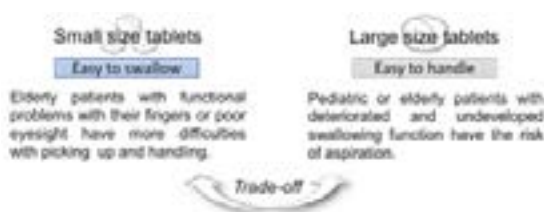
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Evaluations of ease of swallowing and handling tablets of various sizes by healthy volunteers and elderly patients

Shinya Uchida¹ and Noriyuki Namiki¹¹University of Shizuoka, Japan

Among the various types of drug formulations available, such as tablets, capsules, and granules, tablets are the most widely used because of ease of handling, as well as convenience for carrying and storage. However, many patients have noted difficulties with swallowing tablets with a large diameter. Mini-tablets with a diameter ≤ 4 mm have been widely studied and developed, and are considered to be easier to swallow as compared to conventional tablets. Decreased tablet diameter may improve patient adherence to medication and reduce the risk of aspiration of tablets. On the other hand, as tablet diameter is reduced, patients have more difficulties with picking them up and handling. Thus, in regard to tablet diameter, ease of swallowing is countered by more difficulties with handling, both of which can have effects on prescription adherence. In this study, we evaluated the ease of taking and handling on placebo tablets of 2–8 mm in diameter with the aim of clarifying the acceptable tablet diameter for patients. We manufactured tablets with 7 different sizes (2, 3, 4, 5, 6, 7, 8 mm). The study protocol was approved by the Ethics Committee of the University of Shizuoka. We conducted two clinical randomized crossover trials (swallowing trial and handling trial). To evaluate ease of swallowing (swallowing trial), 17 healthy young volunteers were asked to use the minimum volume of water required to smoothly consume each tablet, and to evaluate ease of swallowing using a visual analogue scale (VAS). In handling trial, 25 elderly patients participated. Each patient was asked to pick up 10 tablets from a dish and place them in a medication cup 30 cm distant from the dish, one by one. After finishing, they were asked to evaluate the ease of handling the tablets using a VAS. For the swallowing trial, VAS scores for ease of swallowing were also decreased for tablets 5 mm as compared to those 8 mm in diameter. For tablets < 5 mm in diameter, VAS scores were nearly the same. As for the handling trial, the time required for the elderly patients to transfer all tablets was reduced from 32.8–22.2 seconds when the diameter of the tablets was from 2–4 mm. With tablets > 5 mm, the time for handling was nearly the same regardless of size. VAS results for handling tablets was similar to the evaluation of handling time. The present results indicate that tablets < 5 mm in diameter are easy to swallow, while those > 5 mm offer good handling. Thus, a 5-mm tablet seems to adequately fulfill needs in regard to both swallowing and handling.



Recent Publications

1. Hayakawa Y, Uchida S, Namiki N. (2016) Evaluation of the ease of taking mini-tablets compared with other tablet formulations in healthy volunteers. *Eur J Pharm Sci*, 84, 157-161.
2. Nakagaki F, Uchida S, Tanaka S, Namiki N. (2018) Palatability and Preference of Gummi Formulations with Various Pharmaceutical Characteristics. *Chem Pharm Bull*, 66:452-457.

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3. Katayama T, Uchida S, Kamiya C, Tanaka S, Kashiwagura Y, Hakamata A, Odagiri K, Inui N, Watanabe H, Namiki N. (2018) Palatability and Preference of Gummi Formulations with Various Pharmaceutical Characteristics. *Chem Pharm Bull*, 66:452-457.
4. Yasumuro O, Uchida S, Kashiwagura Y, Suzuki A, Tanaka S, Inui N, Watanabe H, Namiki N. (2018) Changes in gefitinib, erlotinib and osimertinib pharmacokinetics under various gastric pH levels following oral administration of omeprazole and vonoprazan in rats. *Xenobiotica*, 48, 1106-1112.

Biography

Shinya Uchida received his PhD degree from University of Shizuoka in 1999. Dr. Uchida served as a clinical pharmacist at University Hospital of Hamamatsu School of Medicine. He is associate professor at University of Shizuoka and his major interests include clinical pharmaceutical science, clinical pharmacology and pharmacokinetics. He has published more than 50 papers in reputed journals.

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