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Equipotent doses of transdermal fentanyl and transdermal buprenorphine in patients with cancer and noncancer pain: results of a retrospective cohort study.

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Abstract

BACKGROUND: The equipotency ratio of transdermal (TD) fentanyl to oral morphine has been established as 1:100; for buprenorphine TD, a ratio of 1:75 has been proposed, although this ratio has not been confirmed in clinical studies. Growing evidence from clinical practice, in which much lower doses of buprenorphine are used, suggests that this conversion ratio may be too high.

OBJECTIVE: The aim of this study was to compare calculated equipotent oral morphine doses of fentanyl TD with equipotent oral morphine doses of buprenorphine TD prescribed in clinical practice.

METHODS: This retrospective study identified patients with cancer and noncancer pain who had received $> \text{or} = 1$ prescription for fentanyl TD or buprenorphine TD (the all-patients groups) from the German IMS Disease Analyzer-mediplus database, which contains all relevant data concerning drug prescriptions from 400 practices in Germany. Also identified were subgroups of the all-patients groups who had received long-term treatment with fentanyl TD or buprenorphine TD and were considered to have similar pain intensity, as they had previously received similar analgesic medication (the identical-cohort groups). Mean prescribed daily doses for the all-patients and identical-cohort groups were calculated based on the distribution of prescribed patch strengths. Because patients could have applied > 1 patch, mean prescribed daily doses were also calculated based on an assumption of double application when appropriate. Equipotent oral morphine doses were estimated using equipotency ratios of 1:100 for fentanyl TD and 1:75 for buprenorphine TD.

RESULTS: The all-patients groups consisted of 2198 patients with noncancer pain and 2544 patients with cancer pain; the identical-cohort groups consisted of 380 patients with noncancer pain and 496 patients with cancer pain (529 women, 347 men; mean age, 74 years [range, 25-101 years]). Equipotent doses of oral morphine were significantly lower in patients receiving buprenorphine TD compared with those receiving fentanyl TD ($P < 0.001$). In cancer patients, the equipotent oral morphine doses of fentanyl TD and buprenorphine TD were 130.9 to 138.9 mg and 85.2 to 88.8 mg, respectively; in noncancer patients, the corresponding values were 117.0 to 118.3 mg and 80.2 to 80.9 mg. Based on these results, an equipotency ratio of 1:110 to 1:115 for buprenorphine TD would appear to be more appropriate than the proposed ratio of 1:75.

CONCLUSIONS: The fact that this retrospective analysis conducted in identical cohorts showed lower calculated equipotent oral morphine doses in the buprenorphine TD groups compared with the fentanyl TD groups calls into question the proposed 1:75 ratio for conversion of buprenorphine TD to equipotent oral morphine doses. Based on the findings of the present study, an equipotency ratio of 1:110 to 1:115 may be more appropriate. However, confirmative data from prospective randomized clinical trials are needed.

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