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## Simultaneous comparison of 22 acute migraine medications from smartphone application data: A real-world patient experience study using 10 million migraine attack records

**Xuemin Fang**

Graduate School of Health Innovation Kanagawa University of Human Services, Japan

Migraine, the third-highest cause of disability worldwide, is associated with significant disruption to one's daily activity. We analyzed the millions of migraine attacks recorded by patients in the real-world setting, to compare the efficacy of various migraine abortive medications. 10,842,795 migraine attack records were extracted from a smartphone application "Migraine Buddy" database using the filtering criteria "English speaking user". We focused on five most popular treatment categories: NSAIDs, Triptans, Acetaminophen, Barbiturate and Opioid, resulting in 24 different comparison candidates, and employed the nested logistic regression model to estimate the odds ratio (OR) associated with the selected treatment options after adjusting pain intensity, other concurrent medications, as well as the covariance within the same user. The treatment that had the best efficacy is Treximet (OR 2.68), which is a combination of Sumatriptan and Naproxen. It was followed by Sumatriptan (OR 2.10), Eletriptan (OR 2.05). Barbiturate, Acetaminophen and NSAIDs followed behind with odds ratios ranging from 1.48 to 1.03. The users considered Opioid to be helpful in general, with odds ratios ranging from 1.08 to 1.58. All the estimated odds ratios are statistically significant. Pain intensity score was also a significant factor for the outcome of the medication. Our analysis demonstrated that triptans are considered the most helpful migraine abortive medications. The results are consistent with our clinical experience and recommendations. The factor that the pain intensity score is also an important factor provides additional evidence to support the clinical recommendation to treat the attacks at the early stages of migraine when the pain level is low.

mindy.fang@gmail.com