

Title:

All or nothing: Issues surrounding the measurement and analysis of frequency of use data.

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Introduction and Aims:

The 'all or nothing' nature of drug use in treatment-seeking populations represents a potential pitfall for researchers who use frequency of use as a measure of treatment efficacy. The standard statistical tests, such as ANOVA or regression, are predicated on the assumption that outcomes are distributed normally. Frequency-of-use data is often distributed bimodally, hence analysis with standard tests may lead to incorrect conclusions concerning treatment effectiveness. We discuss approaches to analysing frequency-of-use data from a randomised controlled trial testing the efficacy of a THC agonist (nabiximols) for treating cannabis dependence.

Approach and Key Findings:

A regression testing the difference in total days' use of illicit cannabis across the 84-day trial suggested nabiximols was associated with fewer days' use than placebo ($p=0.015$). Despite appearing bimodal, a quantile-quantile plot revealed model residuals to be sufficiently close to normal to satisfy the normality assumption. A longitudinal analysis, measuring 28-day frequency of use, also showed nabiximols to lead to greater improvement than placebo ($p=0.004$). This 28-day variable was also bimodal, but displayed unacceptable departure from normality. Two approaches were used to address this problem. We calculated a 'percentage-change-from-baseline score' and then transformed this into a binary '≥ 50% reduction in days' use' versus '<50% reduction', which also favoured the nabiximols group ($p=0.029$). A non-parametric longitudinal analysis indicated the time curves for the treatment groups were not parallel ($p=0.003$), confirming the results from the parametric analysis.

Discussions and Conclusions:

When frequency of use variables are distributed bimodally, judicious use of assumption tests, transformation, and non-parametric techniques can be used to strengthen the credibility of the results from standard statistical tests.

Disclosure of Interest Statement:

Study drug (nabiximols and placebo) were provided free of charge by GW Pharmaceuticals, UK.