Longitudinal Opioid Use in Patients Treated with Buprenorphine: A “Missing Not at Random” (MNAR) and “Missing at Random” (MAR) Growth Model Comparison

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BACKGROUND & AIDS

1. The random effects model that uses the 28-day taper (B = 0.41, p<.05) was predictive of the baseline UA slope (B = 0.01, p<.05). The estimated Diggle and Kenward (1994) model demonstrated an effect of the 28-day taper group (B = 0.04, p<.05) on the slope. While none of the models predicted either subsequent or concurrent dropout (see Table 2), the 28-day taper was predictive of dropout after week 7 (B = 0.14, p<.05), 10 (B = 0.04, p<.05), and 4 (B = 0.06, p<.05).

2. The intercept was predictive of the UA slope (B = 0.15, p<.05), similar in size and direction as the MAR model.

3. Wu and Carroll (1988) MNAR selection model where the covariates effects. (1) and (2) indicates regression paths that were held equal.

4. Table 1. Random Linear Growth Model of UA Across Baseline and 4 Subsequent Weekly Visits: Dropout Treatment - Missing at Random approach (MAR Select Model)

5. Table 2. Growth Model of UA Across Baseline and 4 Subsequent Weekly Visits: Missing not at Random, Diggle and Kenward (1994) Selection Model

6. The baseline UA was predictive of the UA slope (B = 0.12, p<.05), similar in size and direction as the MAR model.

7. The current investigation used UA data collected at the baseline visit and 4 subsequent weekly visits during the treatment period.

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10. We utilized latent growth modeling procedures in order to handle the missing values (i.e., missing at random (MAR) vs. missing not at random (MNAR) models; Diggle-Kenward and Wu-Carroll selection modeling).

11. Data for this investigation came from National Drug Abuse Treatment Clinical Trials Network (NDACT-CN; Clinicaltrials.gov unique identifier NCT0003), a clinical trial based on randomized trials of substance use treatment, but appropriate decision making regarding how the missing data is handled.

12. The current investigation used UA data collected at the baseline visit and 4 subsequent weekly visits during the treatment period.

RESULTS

• The UA model shown in the table above indicates that the 28-day taper (B = 0.41, p<.05) was predictive of the baseline UA slope (B = 0.01, p<.05). The estimated Diggle and Kenward (1994) model demonstrated an effect of the 28-day taper group (B = 0.04, p<.05) on the slope. While none of the models predicted either subsequent or concurrent dropout (see Table 2), the 28-day taper was predictive of dropout after week 7 (B = 0.14, p<.05), 10 (B = 0.04, p<.05), and 4 (B = 0.06, p<.05).

• Again, the intercept was predictive of the UA slope (B = 0.15, p<.05), similar in size and direction as the MAR model.

CONCLUSION

• The primary purpose of this work was to compare a 7-day taper with a 28-day taper (i.e., dependent decision in the amount of taper) and assess whether or not the additional taper would produce any differences in treatment outcome.

• The result was that the 28-day taper was not better than the 7-day taper in terms of treatment outcome.

• It is not only important for the research team to consider what the most efficacious treatment data are (i.e., MAR or MNAR), but also whether or not the additional assumptions associated with the MAR and MNAR models are reasonable.

• This investigation highlighted the potential for these modern approaches to missing data to shed light on outcomes and test specific hypotheses regarding the primary outcome of UA.

ACKNOWLEDGMENTS

• No author and Carrarri (1994) MNAR selection model where dropout is a function of the random effects (i.e., intercept and growth factors). The estimated Diggle and Kenward (1994) model demonstrated a significant effect of the 28-day taper on the intercept (B = 0.12, p<.05).

REFERENCES


6. Ling W, Hillhouse M, Domier C, et al. Buprenorphine tapering schedule and illicit drug use during a 28-day taper: a report from the Treatment Clinical Trials Network #0003, a clinical trial based on randomized trials of substance use treatment, but appropriate decision making regarding how the missing data is handled.


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Figures 1. Estimated Diggle and Kenward (1994) random linear growth model of opioid use at the end of week 7 and week 10 showing both subsequent and concurrent dropout with additional covariates effects. (1) and (2) indicates regression paths that were held equal.

Figures 2. Estimated Wu and Carroll (1988) random linear growth model of opioid use at the end of week 7 and week 10 showing both subsequent and concurrent dropout with additional covariates effects. (1) and (2) indicates regression paths that were held equal.