

THE EFFECTS OF TIME OF DAY ON ALCOHOL INDUCED PERFORMANCE DECREMENTS AND SUBJECTIVE RESPONSE



Alford, C. ¹, Griffith, L¹, and Tiplady, B. ²

1. Department of Health and Social Sciences, University of the West of England (UWE) Bristol
 2. Anaesthesia and Pain Medicine School of Clinical Sciences, University of Edinburgh, UK.

PURPOSE:

Rarely have studies investigated the effect of time of day on alcohol induced performance decrements although time of administration has been shown to impact sleep (Roehrs et al 1992). Straw polls amongst students suggest that morning administration may have a greater impairing effect than more usual late afternoon and early evening consumption. The aims of this preliminary study were to compare the effect of morning/am (09:00) and late afternoon/pm (17:00) alcohol administration on performance.

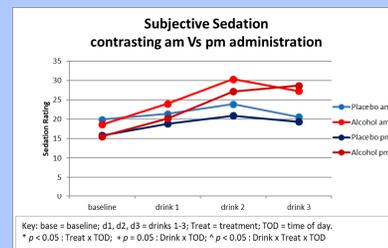
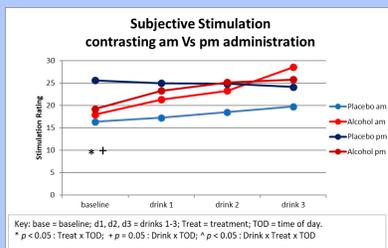
METHODS

Sixteen healthy young adult student volunteers (11 female) aged 18-22 years (mean 20.1; SD 1.5) with a BMI between 18-25 and an AUDIT score not greater than 8, not pregnant or liable to be pregnant and not taking medication that may interact with alcohol took part in the study. They abstained from alcohol for a minimum of 12 hours screened with breathalyser, caffeine for 4 hours but having consumed a light meal within an hour before at the start of each assessment session. Alcohol was administered as 6 x 1 unit drinks of vodka 40% ABV (25ml/unit) combined with 155ml of orange juice compared to 180ml orange juice for the placebo consumed as 3 doubles separated by 20 minute intervals, whilst both drinks had alcohol smeared around the rim to aid placebo masking and administered double blind. Assessments after each of the 3 doubles included the biphasic alcohol effects scale (BAES) and performance measures of attention (RVIP, visual search: VS), inhibition (stop signal task: SST) and memory (serial 7s: S7) using the penscreen test battery (penscreen.com[®]).

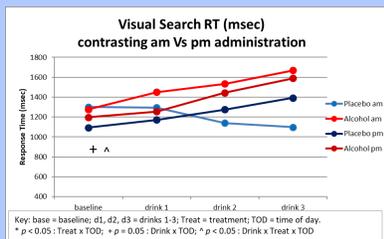
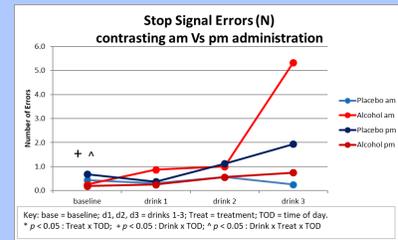
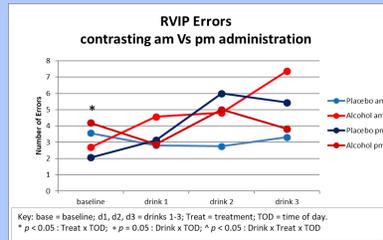
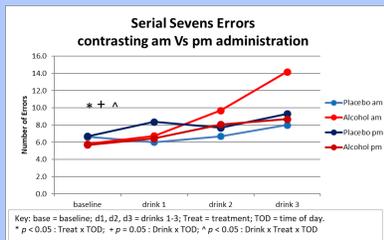
RESULTS

Breath alcohol for am and pm administration averaged 80+/- 3 mg/100ml with greater increase in stimulation reported with alcohol and am administration, whilst sedation increased across drinks uninfluenced by administration time. Alcohol increased SST and S7 errors with greatest errors after the final am but not pm drink. Conversely, visual search errors indicated slower am reaction time though a trend for greater pm errors, whilst greater RVIP errors were again seen in the morning following alcohol.

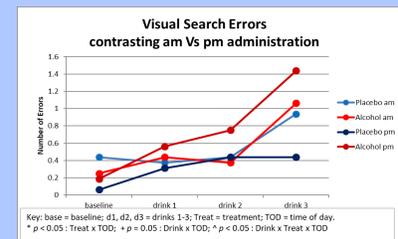
Morning alcohol administration was associated with a greater impact on subjective state compared to placebo



Error scores – were impacted by the highest dose and morning administration



Whilst visual search response times were slowest with morning alcohol administration, visual search errors showed a trend for greater impairment, perhaps linked to a speed/accuracy trade-off, following pm administration.



CONCLUSIONS

This preliminary study has demonstrated some interesting results with the higher levels of alcohol (80mg/100ml) producing a greater effect on subjective stimulation and significant performance decrements that were generally greatest following morning administration. Variation in human performance across the day has long been recognised (circadian rhythms), and variation in the impact of drugs and toxins depending on time of administration and exposure has similarly been recognised (chronopharmacology). Therefore, the effect of time of day on alcohol's impact on subjective state and performance should also receive more formal research investigation. These preliminary findings suggest a potential differential impact on health and safety linked to the time of alcohol consumption