FENTANYL METABOLISM IN MORBIDLY OBESE AFRICAN AMERICAN AND HISPANIC ADOLESCENTS

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INTRODUCTION

• Morbid obesity: an important challenge for the anesthesiologist. Proprietary for changes in drug metabolism and hepatoxicity in obese patients. 7%-18% methadone patients. Including fatty liver disease.
• Correlation between adverse pharmacokinetic outcomes and drug metabolism. Currently there are no data available about the pharmacokinetics of fentanyl (morbidly obese) adolescent.
• Ethnic considerations in this special population with an increased prevalence of obesity and exclusion from drug investigations.
• This study considers the effects of excess weight on the clinical pharmacology of fentanyl metabolism during bariatric surgery.


Obesity/Steatohepatitis: Factors in Drug Metabolism

• Adipokines: chronic inflammation, pro-inflammatory cytokines
• Steatohepatitis: nonalcoholic steatohepatitis, hypercholesterolemia, and obesity (syndrome X)

Methods

Study Design

• Single-center, prospective pilot study (IRB approval)
• Consecutive male patients, 12-21 years of age
• American Society Anesthesiology (ASA) physical status of I, II or III

• Weight defining using CDC BMI percentile and includes the categorization of normal weight to morbidly obese. The control group not defined using normal weight adolescents having a BMI between the 50th and 84th percentile. The obese and morbidly obese category was defined with a BMI percentile of greater than the 90th and 99th %

• Eligible patients had uneventful surgical procedures and administered for at least 24 hours

Dosage Administration

• Standard of care at CNMC: Intravenous fentanyl
• Analgesic as part of general anesthesia and pain management

Pharmacokinetic Assessment

• PK: Blood samples were drawn at 0 (prestudy), 1, 3, 30 minutes and 1, 2, 4, 6, 12 and 24 hours post-dose. Additional blood samples were drawn for repeat fentanyl dosing

Statistical Analysis

• A nonparametrical PK analysis was performed using WinNonlin-software.

• Area under the curve (AUC) was calculated by the trapezoidal rule extrapolated method.

• Anesthetic condition was defined as 80% of target duration (15 minutes) and mean residence time (MRT) was estimated for the 3rd and 4th patients

Results-Preliminary

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• Male/female: 6/5.6 kg/m² and systolic erence of fentanyl (5 mg/mL) 167 ± 107 mL and 10.9 ± 3.5 mL/kg

• Compared with historical pharmacokinetic data of fentanyl, our results suggest that fentanyl clearance in morbidly obese adolescents is similar to clearance values in lean adults. These results confirm our current practice to dose fentanyl based on body weight to obese patients.

• Ongoing efforts include genotyping for CYP3A5 and stratification of fatty liver disease.

Conclusion

• More favorable, AUC was 6.8 kg/m² and systolic erence of fentanyl (5 mg/mL) 167 ± 107 mL and 10.9 ± 3.5 mL/kg

BIBLIOGRAPHY


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