

A Comparative Study Between Fentanyl - Midazolam With Pentazocine - Promethazine For Conscious Sedation During Cardiac Catheterization

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Citation

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Abstract

INTRODUCTION

The role of the anaesthesiologist in the cardiac catheterization laboratory (cath. Lab.) has gained unique importance in last decade. Many studies are being conducted for proper anaesthesia and sedation techniques used in cardiac catheterization for paediatric patients but very few for adults.

The duration of above mentioned procedures can be anywhere between 15 min to 2-3 hrs and the procedures can be well conducted under local anaesthesia.

The patient should be aware and should be responsive to verbal commands during these procedures. The patient should be able to cough, deeply breath and should hold his breath as per the requirement which facilitates the distribution of dye. Similarly the patient should be able to communicate whenever he / she feels the pain.

Monitored anaesthesia care (MAC) is the terminology used for sedation given along with the local anesthesia for short procedures.

We compared two drug combinations i.e. Fentanyl (opioid) and Midazolam (Benzodiazepine) with pentazocine (opioid) promethazine which is routinely used in cardiac catheterization.

AIMS AND OBJECTIVES

To compare fentanyl –midazolam with pentazocine –promethazine for

- Conscious sedation
- Their anxiolytic effects

- Their cardiovascular effects
- Their respiratory system effects
- Their amnestic properties
- Other side effects associated with their use in adult patient during cardiac catheterization procedures.

PHARMACOLOGY

FENTANYL

INTRODUCTION

Fentanyl is a synthetic opioid agonist that is structurally related to meperidine. As an analgesic, fentanyl is 75 to 125 times more potent than morphine.

MIDAZOLAM

Intravenous sedation: midazolam is the most commonly used benzodiazepine for preoperative medication and induction of anaesthesia. Rapid onset, greater amnesia and less postoperative sedation make it an ideal sedative.

PENTAZOCINE

Introduction: pentazocine is a benzomorphan derivative that possesses opioid agonist as well as weak antagonist actions.

PROMETHAZINE

Is used as a sedative and hypnotic during anaesthesia, and as a premedication for anaesthesia, in children and adults and in obstetrics and psychiatry.

MATERIAL AND METHODS

A study of 30 cases in each sedative group i.e. Fentanyl + Midazolam Group I and pentazocine + Promethazine group

It was carried out at the Department of Anaesthesia of our postgraduate institute.

PATIENT SELECTION

60 patients of ASA grade II and Grade III between 35-75 years of either sex were randomly selected from the routine list for cardiac catheterization procedure of our institute for the present study.

PROCEDURE PERFORMED

The procedure that the patients underwent in both group are shown in table 5 figure 7. Of these 65% underwent coronary angiography, 26.66 % patients underwent PTCA (percutaneous transluminal coronary angioplasty), 6.66% patient underwent BMV (Balloon mitral valvotomy) and the other patients underwent cardiac catheterization for ASD (Atrial Septal defect). Thus in the present study 91.66% of the patients were known cases of ischaemic heart disease (IHD) with / without past evidence of myocardial infarction.

In Group I, patients were sedated with Fentanyl (Range 0.4-0.6µgm/kg) mean dose 0.43µgm/kg (\pm 0.11) µgm/kg + Midazolam (Range 0.03 – 0.07 mg/kg), mean dose 0.051 (\pm 0.016) mg/kg.

In Group II, patients were sedated with Pentazocine (range 0.3 – 0.5 mg/kg) mean dose 0.32 (\pm 0.11) mg/kg + promethazine (range 0.4 – 0.6) mg/kg mean dose 0.47 (\pm 0.06) mg/kg.

MONITORING DURING THE PROCEDURE

In all patients of either group the following parameters were noted. Pulse rate, BP, Respiratory rate, SaO₂ after administering sedative and during the procedure at regular time interval of 5,10,15,20,30,45 etc. minutes (from the time of sedation being given) till procedure lasted.

During the procedure all patients were breathing room air. BP and pulse rate and rhythm were monitored continuously by direct invasive blood pressure monitoring and ECG respectively.

OBSERVATIONS AND RESULTS

The sedation score achieved in each group.

Figure 1

	Gr. I n = 30		Group II n = 30	
Sedation score	No. of patients	%	No. of patients	%
0	2	6.66	-	-
1	20	6.66	24	80
2	8	26.66	6	20
3	-	-	-	-
4	-	-	-	-

Thus, it is clear from the above table that while all patients in group I were sedated, in group II two patients out of the 30 were not sedated even after reaching the maximum dosage range mentioned for pentazocine and promethazine, the remaining 28 patients achieved the required level of sedation.

Also none of patients in either group was too deeply sedated.

The mean calculated dose in each group was as follows:

Figure 2

Study group	Drug	Mean dose
Group I	Fentanyl	0.43 (+/- 0.11) µgm/kg
	Midazolam	0.051 (+/- 0.016) mg/kg
Group II	Pentazocine	0.32 (+/- 0.11) mg/kg
	Promethazine	0.47 (+/- 0.06) mg/kg

SUMMARY AND CONCLUSION

From the present study, it is evident that though both the drug combinations i.e. intravenous fentanyl 10.43 µgm/kg [\pm 0.11] midazolam 0.051 (\pm 0.016) mg/kg and intravenous pentazocine 0.32 (\pm 0.11) mg/kg with promethazine 0.47 (\pm 0.06) mg/kg produced equivalent sedation in adult patients during various cardiac catheterization procedures. (91.66%) were cases of coronary disease.

Fentanyl -midazolam drug combination was more cardiostable causing a clinically non-significant fall in mean arterial pressure and rate pressure product (peak fall occurred at 10 min.) and no statistically significant change in pulse rate. Pentazocine and promethazine caused marked and significant rise in pulse rate, mean arterial pressure and rate pressure product (peak rise within 15 min.) requiring intervention in 3 patients of which one patient had chest pain.

Clinically significant fall in respiratory rate and SaO₂ was observed only in one patient with fentanyl-midazolam and in 2 patients receiving pentazocine and promethazine. All the patients were over 60 years thus asking for close vigilance.

Also fentanyl-midazolam produced better anxiolysis and amnesia, and were comparatively short acting, therefore produced less side effects than the combination of pentazocine and promethazine.

It can be concluded that Fentanyl-midazolam is the preferable drug combination and is preferable to pentazocine-promethazine for conscious sedation in adult patients in various cardiac catheterization procedures like coronary angiography, coronary angioplasty, balloon mitral valvuloplasty etc.

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