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PROCEDURAL SEDATION IN ERCP WITH PROPOFOL-KETOROLAC, PROPOFOL-DEZOCINE AND PROPOFOL -FENTANYL: A COMPARATIVE STUDY

Dr. Shamim Ara Sultana[1], Dr. Md. Abdullah Tareq Bhuiyan[2], Dr. Mohammad Ekramul Haque[3], Dr. Rebeka Sultana[4], Dr. Amina Rahman[5], Dr. Malaya Kumar Das[6], Dr. Noor-E-Alam Siddique[7]

1. Medical officer, Department of Anaesthesiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
2. Assistant Professor, Department of Anaesthesiology, Dhaka Medical College Hospital, Dhaka, Bangladesh.
3. Assistant Professor, Department of ICU and Anesthesia, Sheikh Hasina National Institute of Burn and Plastic Surgery (SHNIBPS), Bangladesh.
4. Assistant Professor, Department of ICU and Anesthesia, Sheikh Hasina National Institute of Burn and Plastic Surgery (SHNIBPS), Bangladesh.
5. Assistant Professor, Department of Anaesthesiology, Sheikh Hasina Medical College, Jamalpur, Bangladesh.
6. Associate Professor, Department of ICU and Anesthesia, Sheikh Hasina National Institute of Burn and Plastic Surgery (SHNIBPS), Bangladesh.
7. Associate Professor, Department of Anaesthesiology, Dhaka Medical College Hospital, Dhaka, Bangladesh.

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ABSTRACT

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Background: The comparative outcomes of ketorolac, dezocine, and fentanyl had been evaluated in 150 healthy patients undergoing endoscopic methods in accordance to a randomized, double-blind protocol. Patients obtained ketorolac or dezocine or fentanyl 5min before procedure. The optimal dose of intravenous ketorolac triomethamine (ketorolac), a non-steroidal anti-inflammatory drug has no longer been decided in children. There are only restrained published data on the use of intravenous ketorolac for pediatric analgesia. **Objectives**: The aim of this study is to assess the patients with Procedural Sedation in ERCP with Propofol-Ketorolac, Propofol-Dezocine and Propofol, so that such patients can be diagonsed and treated early. **Methods:** This is an observational study. The study was carried out in the Department of Anaesthesiology, Dhaka Medical College Hospital in Bangladesh for the duration of one year (the period from June 2021 to May 2022). **Results:** This study shows that the according to age of 150 Patients aged 18 to 50 years where, 25(16.16%) were 18-30 years, 82(54.67%) were 31-40 years and 43(28.67%) were

Corresponding author
Dr. S. A. Sultana*

41-50 years. According to Propofol-Ketorolac the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 460±205, 25±39, 55±30 and 62±30 respectively, based on Propofol-Dezocine the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 440±165, 24±35, 56±28 and 65±23 respectively and according to Propofol – Fentanyl the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 473 ± 220, 20 ± 26, 53 ± 38 and 61 ± 37 respectively. **Conclusions:** Ketorolac appears to examine favorably with fentanyl when administered at some stage in Endoscopic procedures. In distinction to ketorolac, the use of dezocine resulted in an accelerated incidence of postoperative nausea and vomiting, contributing to a prolongation of the discharge time.

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INTRODUCTION

Endoscopic retrograde cholangio pancreatography (ERCP) is a procedure which is used both diagnostically and therapeutically. Now-a-days ERCP procedure is increasing day by day to evaluate pancreato-biliary ductal anatomy through the use of fluoroscopy and contrast of determine both benign and malignant pathology. In Dhaka Medical College Hospital about 872 patients has undergone ERCP procedure in 2021. Most common indication are choledocholithiasis, acute biliary pancreatitis, ascending cholangitis, unspecified obstruction and panceratic head mass[1].

Most of the patients now-a-days do not want to undergo painful or stressful endoscopic procedure without adequate sedation and analgisia. Immolibity of the patients at prone position during ERCP procedure is important. For therapeutic procedure deep sedation is expected (Modified observers assessment of Alert score 2-1) which is almost safe with some expectations as ASA physical status IV, Cardio respiratiory decompensated patients with COPD. During sedation ECG (heart rate, rhythm) NIBP, SpO_2 and respiratory rate monitoring is must[2].

Aldrete score at least 9 or similar to the pre-procedure score was the standard of recovery. A period of at least 30min after stopping of sedation seems to be appropriate for recovery of the patients.

The comparative consequences of ketorolac, dezocine, and fentanyl have been evaluated in patient's present for endoscopic procedure in accordance to a randomized, double-blind protocol. Patients acquired ketorolac (60 mg) or dezocine (6 mg) or fentanyl (100 µg) 5min before anaesthesia. A standardized standard anesthetic approach consisting of propofol (2 mg/kg) for induction of anesthesia accompanied by way of propofol (120 $\mu gkg^{-1}. min^{-1}$), for maintenance of anesthesia, was used. [1] In the post anesthesia care unit, 61% of patients in the fentanyl group acquired analgesic drugs for persistent pain, in contrast with 34% and 25% in the ketorolac and dezocine groups, respectively. Similarly, much less postoperative fentanyl (mean ± SD) was once required in the ketorolac (22 ± 33 µg) and dezocine (18± 35 µg) groups, in contrast with the fentanyl (58 ±71µg) group. [1] However, 52% of the patients receiving dezocine required anti-nausea remedy in the post anesthesia care unit, in contrast with 20% and 18% in the fentanyl and ketorolac groups, respectively. Finally, restoration instances had been extensively shorter in the ketorolac (vs dezocine) group. Although each ketorolac and dezocine had been positive preferences to fentanyl when administered at some point of

outpatient laparoscopy, dezocine used to be related with an extended incidence of postoperative nausea and a delayed discharge time in contrast with ketorolac. [3]

Potent, rapid-acting opioid analgesics (e.g., fentanyl) are broadly used adjuvants throughout anesthesia. [4] In addition to enhancing intraoperative conditions, these compounds provide effective pain comfort on emergence from regular anesthesia. Unfortunately, opioids increase the incidence of postoperative nausea and vomiting. [5] These damaging outcomes have inspired the search for alternative drugs to grant analgesia at some stage in and after anesthesia. Ketorolac and dezocine are parenteral analgesics that have been accredited for clinical use. Ketorolac, a nonsteroidal anti-inflammatory drug that inhibits prostaglandin synthesis, is alleged to have related analgesic efficacy to morphine when administered for postoperative pain relief. [4, 5] Dezocine, an opioid modulator, acting as a partial aganist of all μ and ƙ opioid receptors. Dezocine does not produce side effects as dysphoria or hallucination when used therapeutically. But a ceiling effect to dezocine induced respiratory depression occurs with increasing dosage [6].

METHODS

This is an observational study. The study used to be carried out in the admitted patient's Department of Anesthesia, Analgesia, Palliative and ICU, Dhaka Medical College Hospital, Dhaka, Bangladesh. In Bangladesh for the duration of the period from June 2021 to May 2022. This study was carried out on 150 patients above 18 years of age. Primarily involved in the decision-making process were surgical gastroenterologist.

The data for this study about had been accumulated from patients' medical information and radiographs. Statistical evaluation of the results used to be got via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

RESULTS

Table I: Distribution of the study according to age

Table I: Age distribution of Procedural Sedation in ERCP patients (n=150)

Age Distribution	n	%
18-30	25	16.66
31-40	82	54.67
41-50	43	28.67

Table I demonstrated and distribution of the study according to age of 150 Patients aged 18 to 50 years. Here according to Age distribution, 25(16.16%) were 18-30 years, 82(54.67%) were 31-40 years and 43(28.67%) were 41-50 years.

Table II: Intraoperative data for the three treatment groups

Intraoperative data	Propofol-Ketorolac (n=50)	Propofol-Dezocine (n=50)	Propofol – Fentanyl (n=50)
Propofol Dosages (mg)	460±205	440±165	473±220
Supplement fentanyl (μg)	25±39	24±35	20±26
Operating time (min)	55±30	56±28	53±38
Anesthesia time (min)	62±30	65±23	61±37

Table II Distribution of the study according to Intraoperative data for the three treatment groups. According to Propofol-Ketorolac (n=50) the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 460±205, 25±39, 55±30 and 62±30 respectively. Based on Propofol-Dezocine (n=50) the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 440±165, 24±35, 56±28 and 65±23 respectively. And according to Propofol – Fentanyl (n=50) the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 473±220, 20±26, 53±38 and 61±37 respectively.

Table III: Recovery Times for Three Treatment Groups

Recovery Times	Propofol-Ketorolac (n=50)	Propofol-Dezocine (n=50)	Propofol – Fentanyl (n=50)
Time to eye opening (min)	3.4±1.85	4.1±1.9	3.7±2.2
Time to following Command (min)	4.6±2.4	5.5±2.3	4.4±2.5
Time to sitting in chair (min)	68±23	78±31	74±29
Time to oral intake (min)	77±30	89±43	95±43
Time to ambulation (min)	123±38	164±69	143±55
Time to discharge (min)	143±42	195±78	176±75

Table II Distribution of the study according to Recovery Times for Three Treatment Groups. According to Propofol-Ketorolac (n=50) the Recovery Times of Time to eye opening, Time to following Command, Time to sitting in chair, Time to oral intake, Time to ambulation and Time to discharge were 3.4±1.85, 4.6±2.4, 68±23, 77±30, 123±38and 143±42respectively.Based on Propofol-Dezocine (n=50) the Recovery Times of Time to eye opening, Time to following Command, Time to sitting in chair, Time to oral intake, Time to ambulation and Time to discharge were 4.1±1.9, 5.5±2.3, 78±31, 89±43, 164±69 and 195±78 respectively. And according to Propofol – Fentanyl (n=50) the Recovery Times of Time to eye opening, Time to following Command, Time to sitting in chair, Time to oral intake, Time to ambulation and Time to discharge were 3.7±2.2, 4.4±2.5, 74±29, 95±43, 143±55 and 176±75 respectively.

Table 4: The incidence of pain and other side effects in the three treatment groups in the post-anesthesia care unit.

The incidence of pain and other side effects	Propofol-Ketorolac n=50 (%)	Propofol-Dezocine n=50 (%)	Propofol – Fentanyl n=50 (%)
Pain	21(42)	20(40)	36(72)
Nausea	9(18)	29(58)	18(36)
Vomiting	5(10)	13(26)	4(8)
Analgesic	16(32)	12(24)	30(60)
Antiemetic	8(16)	25(50)	9(18)

Table IV Distribution of the study according to the incidence of pain and other side effects in the three treatment groups in the post-anesthesia care unit. According to Propofol-Ketorolac (n=50) the incidence of pain and other side effects of Pain, Nausea, Vomiting, Analgesic and Antiemetic were 21(42) %, 9(18) %, 5(10) %, 16(32) % and 8(16) % respectively. Based on Propofol-Dezocine (n=50) the incidence of pain and other side effects of Pain, Nausea, Vomiting, Analgesic and Antiemetic were 20(40) %, 29(58) %, 13(26) %, 12(24) % and 25(50) % respectively. And according to Propofol – Fentanyl (n=50the incidence of pain and other side effects of Pain, Nausea, Vomiting, Analgesic and Antiemetic were 36(72) %, 18(36) %, 4(8) %, 30(60) % and 9(18) % respectively.

DISCUSSION

Potent, rapid, and short-acting opioid analgesics are regularly used during ambulatory surgical treatment due to the fact they enhance surgical conditions (e.g., reduce patient movement), and their anesthetic-sparing effects provide for a greater fast emergence from anesthesia. [7, 8] dezocine additionally possesses anesthetic sparing movements [9], not such for ketorolac. Our study about would advise that ketorolac (60 mg) is comparable to fentanyl (100 µg) and dezocine (6 mg) during ERCP procedure. In addition, the intra procedural necessities for supplemental fentanyl had been additionally comparable in all three treatment groups. In this study, in accordance to age of 150 Patients aged 18 to 50 years and in accordance to Age distribution, 25(16.16%) have been 18-30 years, 82(54.67%) have been 31-40 years and 43(28.67%) had been 41-50 years.

In inspecting patient complaints of postoperative pain, each ketorolac and dezocine seemed to provide a gain over fentanyl. The residual analgesia in the ketorolac and dezocine organizations contributed to a reduce in the postoperative analgesic requirement. Compared with the fentanyl group, the patient's pain and sedation visual analogue scale (VAS) scores had been persistently decrease in the ketorolac group in early postoperative period. Given the extended postoperative analgesia related with the use of ketorolac (vs fentanyl), it would appear to provide some benefits over the famous rapid, short-acting opioid analgesic for intraprocedural period. Additional studies are needed to consider the effectiveness of ketorolac when administered for the duration of different ambulatory surgical procedures. In the outpatient setting, intractable nausea, retching, and vomiting are amongst the main reasons of unexpected hospital admissions. [10] Even transient nausea and vomiting can lengthen the instances to discharge after short surgical procedure. [11, 12] Thus, the longer time to discharge for the dezocine group used to be probable associated to the greater incidence of emetic sequelae in that find out about group. Our information for dezocine is consistent with previously published studies involving the adjunctive use of the agonist antagonists nalbuphine and butorphanol throughout outpatient anesthesia. [13, 17] Even though >50% of the dezocine-treated patients acquired antiemetic therapy in the PACU, the nausea VAS rating was once significantly extensively greater than in the different two treatment groups 2h after the operation.

In this study, according to Propofol-Ketorolac the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 460±205, 25±39, 55±30 and 62±30 respectively, based on Propofol-Dezocine the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time and Anesthesia time were 440±165, 24±35, 56±28 and 65±23 respectively and according to Propofol – Fentanyl the Intraoperative data of Propofol Dosages, Supplement fentanyl, Operating time

and Anesthesia time were 473±220, 20±26, 53±38 and 61±37 respectively.

In inspecting patient complaints of postoperative pain, each ketorolac and dezocine regarded to provide a gain over fentanyl. The residual analgesia in the ketorolac and dezocine groups contributed to a decrease in the postoperative analgesic requirement. Compared with the fentanyl group, the patient pain and sedation VAS ratings had been persistently decreased in the ketorolac group at some stage in the early postoperative period. Given the accelerated postoperative analgesia related with the use of ketorolac (vs fentanyl), it would appear to provide some medical blessings over the famous rapid, short-acting opioid analgesic for ERCP approaches when administered for the duration of the intraoperative period. [15] Additional research is wanted to consider the effectiveness of ketorolac when administered all through different ambulatory surgical procedure approaches. The doses of the three analgesic compounds have been chosen on the basis of open dose-ranging research involving a comparable patient population. In a preliminary study about involving ketorolac (30-60 mg IM), we found that only the greater dose produced a large anesthetic- and opioid-sparing impact. [16] The dosages of the three analgesics find out about drugs had been related with comparable intraoperative hemodynamic outcomes and same anesthetic and supplemental analgesic requirements; however, it is viable that a smaller dose of dezocine would have produced same postoperative analgesia with much less nausea and vomiting.

In our study, according to Recovery Times for Three Treatment Groups. According to Propofol-Ketorolac the Recovery Times of Time to eye opening, Time to following Command, Time to sitting in chair, Time to oral intake, Time to ambulation and Time to discharge were 3.4±1.85, 4.6±2.4, 68±23, 77±30, 123±38 and 143±42 respectively, based on Propofol-Dezocine the Recovery Times of Time to eye opening, Time to following Command, Time to sitting in chair, Time to oral intake, Time to ambulation and Time to discharge were 4.1±1.9, 5.5±2.3, 78±31, 89±43, 164±69 and 195±78 respectively And according to Propofol – Fentanyl (n=50) the Recovery Times of Time to eye opening, Time to following Command, Time to sitting in chair, Time to oral intake, Time to ambulation and Time to discharge were 3.7±2.2, 4.4±2.5, 74±29, 95±43, 143±55 and 176±75 respectively.

Non-steroidal anti-inflammatory drugs (NSAIDs) are presently featured prominently in the literature of postoperative pain administration and have been promoted for use as phase of a balanced analgesic routine with opioids and local anesthetics. Ketorolac has been promoted as an NSAID with powerful analgesic properties and used to be the first injectable NSAID to be given [17, 18]

In our study according to the incidence of pain and other side effects in the three treatment groups in the post-anesthesia care unit. According to Propofol-Ketorolac (n=50) the incidence of pain and other side effects of Pain, Nausea, Vomiting, Analgesic and Antiemetic were 21(42) %, 9(18) %, 5(10) %, 16(32) % and 8(16) % respectively. Based on Propofol-Dezocine (n=50) the incidence of pain and other side effects of Pain, Nausea, Vomiting, Analgesic and Antiemetic were 20(40) %, 29(58) %, 13(26) %, 12(24) % and 25(50) % respectively. And according to Propofol – Fentanyl (n=50the incidence of pain and other side effects of Pain, Nausea, Vomiting, Analgesic and Antiemetic were 36(72) %, 18(36) %, 4(8) %, 30(60) % and 9(18) % respectively.

The results of ketorolac in decreasing postoperative vomiting in the first 24 hours was once significant (<0.0166) in all doses in contrast to opioids.

Limitations of the Study

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.

CONCLUSION

ketorolac (60 mg) appears to compare favorably with fentanyl (100 µg) when administered during outpatient laparoscopic procedures. In contrast to ketorolac, the use of dezocine (6 mg) resulted in an increased incidence of postoperative nausea and vomiting, contributing to a prolongation of the discharge time. Its use was associated with a significant reduction in the incidence of postoperative vomiting.

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DECLARATION

Conflict of interest: None declared.

REFERENCES

1. Kröner PT, Bilal M, Samuel R, Umar S, Abougergi MS, Lukens FJ, Raimondo M, Carr-Locke DL. Use of ERCP in the United States over the past decade. Endoscopy International Open. 2020 Jun;8(06):E761-9.
2. van Haperen M, Preckel B, Eberl S. Indications, contraindications, and safety aspects of procedural sedation. Current Opinion in Anesthesiology. 2019 Dec 1;32(6):769-75.
3. Ding, Y. and White, P.F., 1992. Comparative effects of ketorolac, dezocine, and fentanyl as adjuvants during outpatient anesthesia. Anesthesia & Analgesia, 75(4), pp. 566-571.
4. Shafer, A., White, P.F., Urquhart, M.L. and Doze, V.A., 1989. Outpatient premedication: use of midazolam and opioid analgesics. Anesthesiology, 71(4), pp.495-501.
5. White, P.F. and Shafer, A., 1987. Nausea and vomiting: cause and prophylaxis. In Seminars in anesthesia (Vol. 6, No. 4, pp. 300-308).
6. O'Brien JJ, Benfield P. Dezocine. Drugs. 1989 Aug;38(2):226-48.
7. Shafer, A., White, P.F., Urquhart, M.L. and Doze, V.A., 1989. Outpatient premedication: use of midazolam and opioid analgesics. Anesthesiology, 71(4), pp.495-501.
8. Horrigan, r.w., movers, j.r., johnson, b.h., eger, e.i., margolis, a. And goldsmith, s., 1980. Etomidate vs. thiopental with and without fentanyl—A comparative study of awakening in man. The Journal of the American Society of Anesthesiologists, 52(4), pp.362-364.
9. Hall, R.I., Murphy, M.R., Szlam, F. and Hug Jr, C.C., 1987. Dezocine-MAC reduction and evidence for myocardial depression in the presence of enflurane. Anesthesia and analgesia, 66(11), pp.1169-1174.
10. Gold, B.S., Kitz, D.S., Lecky, J.H. and Neuhaus, J.M., 1989. Unanticipated admission to the hospital following ambulatory surgery. Jama, 262(21), pp.3008-3010.
11. Pataky, A.O., Kitz, D.S., Andrews, R.W. and Lecky, J.H., 1988. Nausea and vomiting following ambulatory surgery: are all procedures created equal? Anesthesia & Analgesia, 67(2), p.163.
12. Dose, V.A., Shafer, A. and White, P.F., 1987. Nausea and voniting after outpatient anesthesia-effectiveness of

dropehiool alone and in combination with metoclopramide. Anesthesia & Analgesia, 66(2), p.S41.

13. Garfield, J.M., Garfield, F.B., Philip, B.K., Earls, F. and Roaf, E., 1987. A comparison of clinical and psychological effects of fentanyl and nalbuphine in ambulatory gynecologic patients. Anesthesia and analgesia, 66(12), pp.1303-1307.
14. Wetchler, B.V., Alexander, C.D., Shariff, M.S. and Gaudzels, G.M., 1989. A comparison of recovery in outpatients receiving fentanyl versus those receiving butorphanol. Journal of clinical anesthesia, 1(5), pp.339-343.
15. DeLucia, J.A. and White, P.F., 1991, September. Effect of intraoperative ketorolac on recovery after outpatient laparoscopy. In The Journal of the American Society of Anesthesiologists (Vol. 75, No. 3, pp. A14-A14). The American Society of Anesthesiologists.
16. 2. Dahl, J.B. and Kehlet, H., 1991. Non-steroidal anti-inflammatory drugs: rationale for use in severe postoperative pain. BJA: British Journal of Anaesthesia, 66(6), pp.703-712.
17. Watcha, M.F., Jones, M.B., Lagueruela, R.G., Schweiger, C. and White, P.F., 1992. Comparison of ketorolac and morphine as adjuvants during pediatric surgery. Anesthesiology, 76(3), pp.368-372.
18. Desparmet, J.F., MacArthur, C., MacArthur, A. and Grillas, B., 1993, September. Pain and vomiting after tonsillectomy in children-a comparison of intraoperative ketorolac and fentanyl. In anesthesiology (vol. 79, no. 3 a, pp. A1194-a1194). Two commerce sq, 2001 market st, philadelphia, pa 19103 usa: lippincott williams & wilkins.