Incidence and factors related to perioperative cardiac arrhythmias in orthopedic surgical patients at Maharaj Nakorn Chiang Mai Hospital

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Background:

Perioperative cardiac arrhythmias are undesirable events that anesthesia providers are concerned with. It can lead to cardiovascular instability. This study was conducted to determine the incidence and factors associated with cardiac arrhythmias that needed treatment during perioperative period in orthopedic surgical patients at Maharaj Nakorn Chiang Mai Hospital.

Method:

The study was a retrospective cohort study. It was part of a perioperative anesthetic complications study in orthopedic surgical patients which was approved by the ethical committee of the faculty of medicine, Chiang Mai University. Data of patients who received anesthesia for orthopedic surgery were prospectively collected during a period from 1st January, 2016 to 31st December 2017. Details of cardiac arrhythmias described in the case record form were retrospectively reviewed by two independent anesthesiologists to determine type of arrhythmias and its management. After exclusion of duplicated records in the database, all relevant data were retrieved to be analyzed by the SPSS software version 22.0. Both descriptive and analytical statistics were used to determine the incidence and factors associated with the cardiac arrhythmias at the statistical significant level of 0.05.

Result:

Excluded 11 duplicated records, data of 7158 orthopedic surgical patients were included in the analysis. Cardiac arrhythmias were found in 56 cases (0.8%). Bradycardia was the most common type (80.4%) followed by PVCs (14.3%). The relative frequencies of cardiac arrhythmias in patients receiving general anesthesia (GA), neuraxial anesthesia, and peripheral nerve blocks were 1.1% (38/3369), 0.6%(16/2645) and 0.6% (7/1144); respectively. From the univariable analysis, factors significantly associated with the cardiac arrhythmias were age > 45 years (p=.018), ASA > 2 (p=.008), and GA (.002). From the multiple variable logistic regression analysis age>45 and GA were found to be more important with odds ratio (95%CI) of 2.05(1.14,3.68) and 2.48(1.40,4.40); respectively.

Table 1 Anesthetic techniques

Anesthetic techniques	n	Percent
General anesthesia	3369	47.1%
Neuraxial blocks	2645	36.9%
Peripheral nerve blocks	1144	16.0%

Table 2 Multiple logistic regression analysis

Variables	Odds ratio (95% CI)
Age ≥45 versus < 45	2.05 (1.14, 3.68)
ASA PS ≥ 3 versus <3	1.673 (0.88, 3.18)
General Anesthesia (GA)	2.48 (1.40, 4.40)

Conclusion:

Bradycardia was the most common type of cardiac arrhythmias in orthopedic surgery. Advanced age and general anesthesia were associated risk factors. The findings indicates that regional anesthesia could be more advantageous particularly for those who are at high risk. Despite increased risk of cardiac arrhythmias, general anesthesia may be indicated in some situations where anesthesia should be optimized and carefully monitored.

Reference

- Yorozu T, Iijima T, Matsumoto M, et al. J Anesth 2007; 21: 136-41.
- Charuluxananan S, Suraseranivongse S, Punjasawadwong Y, et al. J Med Assoc Thai. 2008;91(7):1011-9.
- Pornswan N, Inthiporn K, Preechayuth Y, Surun, et al. J Med Assoc Thai. 2009; 92(3):342-50.
- Alia SD, Mabelle CB, Patricia WN, et at. MEJ Anesth. 2014;22(4):353-60.
- Kwon.CH, Kim.SH. Korean J Anesthesiol. 2017;70(2):120–126.