

## Associated Factors of Perioperative Shivering in Patients Undergoing Orthopedic Surgery under Spinal Anesthesia

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### ABSTRACT

**Background:** Perioperative shivering is common adverse event, causes many serious complications, such as hypoxemia, myocardial ischemia, cardiac arrhythmia.

**Objectives:** To identify associated and risk factors of perioperative shivering in patients undergoing orthopedic surgery under spinal anesthesia.

**Methods:** This was a retrospective case-control study. The orthopedic patients aged 15-85 years undergoing spinal anesthesia at Maharat Nakhon Ratchasima Hospital during April 2019 and September 2019 were reviewed. Fifty-eight shivering patients were identified and labeled as a case group. One hundred sixteen patients were enrolled as a control group. The associated factors were extracted: gender, ASA, age, weight, height, BMI, Hct, type and milligrams of bupivacaine, total intravenous fluid administration, total blood loss, total blood replacement, anesthetic and operative time, operative site and anesthetic level. All associated factors were analyzed by univariate and multivariate analysis for crude and adjusted odds ratios.

**Results:** The shivering group had lower weight, lower height and lower BMI. The milligrams of bupivacaine, total blood loss and operative site at hip and femur were higher in the shivering group. From univariate analysis, crude odds ratios of weight < 60 kg, bupivacaine  $\geq 15$  mg, operative site at hip and femur were 2.598, 2.224 and 2.591. From multivariate analysis, only weight < 60 kg was in the equation with adjusted odds ratio 2.429.

**Conclusion:** The risk factor from multivariate analysis was weight less than 60 kg.

**Keywords:** Orthopedic surgery, Perioperative shivering

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