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Forced-air Warming Device Application in Perioperative Normothermia Program

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Introduction

In Orthopedics and Traumatology (O&T) Department, patients developed hypothermia was not uncommon in some high-risk groups (e.g. prolonged intra-operative period, old age patients) during the peri-operative period. Indeed, hypothermia may increase the chance of surgical site infection (Kurz et al. 1996) and reduce the comfort level of patients. The application of forced-air warming device is an effective and convenient method to maintain patients within normal body temperature.

Objectives

To maintain patients in normothermia and promote patients' comfort by the application of forced-air warming device throughout the peri-operative period.

Methodology

This was an inter-departmental collaboration service between O&T department and department of Anaesthesiology & Operating Theatre Services (Anaes & OTS).

Patients who undergoing elective surgeries and likely to develop hypothermia were selected in O&T department of Queen Elizabeth Hospital (QEH).

The program was divided into three phases. In the pre-operative phase, the selected patient was pre-warmed by forced-air warming device 60 minutes before operation.

Tympanic (TM) temperature was measured and nurses were also asked the comfort level by using ASHRAE thermal sensation scale (Liu et al. 2008) as baseline. After the application, patient's TM temperature, thermal and comfort level were monitored in every 30 minutes until the patient was transferred to operating theatre (OT).

In the intra-operative phase, the forced-air warming device was continued by the OT staff. TM temperature was measured before induction and every 30 minutes until transfer back to ward.

In the post-operative phase, when patient was transferred back to the ward, TM temperature, thermal and comfort level were measured for two consecutive hours. If patient developed hypothermia, the warming device was reapplied and kept monitoring in every 30 minutes.

Result

From February to September in 2016, 50 patients were enrolled in this service totally. The age was ranged from 25 to 93, 21 males (42%) and 29 females (58%). In the pre-operative phase, the valid percentage of patients that kept in normothermia (36.0-37.5°C) before applying the forced air warming device was 90%, and raised to 98% after applied the forced air warming device. In intra-operative phase, the valid percentage of patients that below normothermia at the start time of skin incision was 6.1%, and raised to 18.2% at 120 minutes after skin incision. But importantly, 100% of the enrolled patients can be kept in normothermia in the post-operative phase. There was 44 of 45 (97.8%) and 24 of 24 (100%) patients felt comfortable after applying warming device for 30 minutes and 60 minutes respectively. Therefore, forced-air pre-warming increased the sensation of warmth peri-operatively. Importantly, it is suggested that 30-60 minutes pre-warming is an effective measure to reduce the perioperative hypothermia.