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THE USE OF HANDHELD HAIR DRIER AS A WARMER FOR HYPOTHERMIA POST LAPAROSCOPIC SURGERY

By

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Abstract

Background: *Postoperative hypothermia is a common complication following laparoscopic surgery, particularly in resource-limited settings where standard warming equipment is unavailable. Hypothermia can lead to increased morbidity, prolonged hospital stays, and impaired wound healing.*

Aim: *To evaluate the safety and effectiveness of a domestic handheld hairdryer as a warming device for postoperative hypothermia.*

Methods: *Twenty postoperative patients (12 females, 8 males) presenting with core body temperature <36.0°C after laparoscopic surgery were managed using a handheld hairdryer set to low or medium heat. The device was held 30–50 cm from the patient and used intermittently over covered areas to avoid burns. Core temperature was monitored every 5 minutes.*

Results: *All patients achieved normothermia (≥36.5°C) within 4–10 minutes. There were no incidences of skin burns, discomfort, or other adverse effects. Patients reported improved thermal comfort and reduced shivering.*

Conclusion: *A domestic handheld hairdryer, when used cautiously, can serve as a practical and safe warming device for managing postoperative hypothermia in low-resource surgical settings.*

Keywords: *Postoperative hypothermia, hairdryer warming, surgical innovation, low-resource setting, laparoscopic surgery.*

Introduction

Postoperative hypothermia (core temperature <36.0°C) is a frequent yet preventable complication following general anaesthesia and laparoscopic surgery [1–3]. It is associated with increased cardiac morbidity, surgical site infections, coagulopathy, and delayed recovery [4–7]. Laparoscopic procedures, in particular, contribute to hypothermia due to insufflation with cold CO_2 gas, prolonged operating time, and exposure of internal surfaces [8,9].

Maintaining normothermia is a standard of care, but in many low- and middle-income countries (LMICs), forced-air warming systems or active conductive devices are either unavailable or unaffordable [10–13]. Passive methods such as warming blankets often fail to restore body temperature effectively [14].

Innovation using readily available tools is critical in resource-limited settings. A handheld hairdryer—commonly found in households and non-medical settings—generates controlled warm airflow and has been proposed as an improvised warming method [15]. Although unorthodox, it offers a potential low-cost alternative in emergency situations or rural surgical centres.

This study investigates the use of a domestic hairdryer to reverse mild to moderate postoperative hypothermia and evaluates its efficacy, safety, and acceptability in real-time surgical recovery settings.

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Methodology

Study Design and Setting

This is a case-based observational study conducted in a tertiary surgical unit in a resource-constrained setting between January and April 2025. This work has been reported in line with the SCARE criteria [16]. This research work has been reported in line with the PROCESS criteria [17].

Patient Selection

Twenty adult patients (≥18 years), who underwent laparoscopic surgeries and developed postoperative hypothermia core temperature <36.0°C within 30 minutes were included.

Intervention

A standard domestic hairdryer, with standardized operations (1200–1500 W power, low to medium wind speed (Fig 1). held approximately 30–50 cm distance) 20 patients were rewarmed to normal body temperature within 4-10 minutes without scalding, and airflow was directed intermittently over covered areas such as the chest, abdomen, and extremities. Care was taken to avoid direct skin exposure. Patients reported reduced chills and improved comfort.

The method of handheld hair dryer warming is demonstrated in Supplementary Video 1.

Temperature (core body) was measured using a thermometer at 5-minute intervals. Warming continued until a temperature ≥36.5°C was achieved.

Ethical Considerations

Informed consent was obtained. Patient identity was anonymized. Institutional ethical approval was granted.

Outcome Measures

- Time to normothermia Core body temperature (T ≥36.5°C)
- Incidence of adverse effects (burns, discomfort)
- Patient-reported thermal comfort
- Observation for rebound hyperthermia or hemodynamic instability

Results

- Total Patients: 20 (12 females, 8 males)
- Average Age: 34.6 ± 7.2 years
- Initial Core Temperature Range: 34.5°C – 35.9°C
- Time to Normothermia: 4–10 minutes
- Adverse Effects: None observed
- Patient Comfort: All patients reported reduced shivering and improved thermal sensation

Discussion

Postoperative hypothermia is a well-documented complication of anaesthesia and surgery, particularly in minimally invasive procedures like laparoscopy where insufflation with cold carbon dioxide and evaporative heat loss from pneumoperitoneum contribute to a drop in core temperature. Despite the well-established association between hypothermia and poor postoperative outcomes—including increased surgical site infections, delayed wound healing, myocardial events, and coagulopathy—the availability of active warming devices remains limited in many low-resource surgical settings [1–7, 19-21].

Traditional methods such as warm IV fluids and passive insulation with blankets often prove inadequate in effectively managing moderate hypothermia. Forced-air warming systems, which have proven efficacy in perioperative normothermia maintenance, remain financially and logistically out of reach for many hospitals in low- and middle-income countries (LMICs) [10–14, 25]. Therefore, there is a pressing need for low-cost, improvisational solutions that can bridge the gap in thermal care for surgical patients.

This study demonstrates that a handheld household hairdryer, used in a controlled and safe manner, can restore normothermia in postoperative patients effectively within 10 minutes. This finding aligns with previous smaller-scale or anecdotal uses in neonatal settings and emergency care where similar devices were used with positive outcomes [15, 24, 32]. Importantly, none of the patients in this study experienced adverse effects such as burns or discomfort, reinforcing the safety of the method when proper precautions are observed—such as covering the skin and maintaining a safe distance (30–50 cm).

Thermal burn thresholds are well known, with studies showing skin damage occurring with temperatures above 44°C if exposure is prolonged [29–31]. By using low to medium heat settings and applying intermittent bursts of warm air, our protocol maintains efficacy while avoiding the risks of continuous direct heat. Furthermore, patient feedback indicated improved thermal comfort and reduced shivering, both of which are important subjective indicators of effective warming.

Frugal innovations such as this are not only feasible but vital in global surgical care. As the global health community continues to emphasize the importance of safe surgery in all contexts, especially under the umbrella of Universal Health Coverage (UHC), devices and approaches that are accessible, scalable, and safe must be encouraged [33–37]. This simple innovation may benefit mobile surgical missions, humanitarian aid settings, and rural health centres.

However, this study is not without limitations. It is a non-randomized, small-sample observational study without a control group, and long-term effects or patient outcomes beyond the initial recovery period were not assessed. Future studies should aim for randomized controlled designs comparing this method with passive and active commercial warming techniques. Cost-benefit analysis, patient satisfaction scoring, and safety monitoring over extended periods could offer further insights into the viability of the method.

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Nonetheless, the ability of a simple, everyday appliance to reverse hypothermia quickly and safely underlines the potential of context-driven innovation in surgical practice.

It is pertinent to state that there is potential danger posed by used of high heat, hence careful monitor of body temperature is very important. This is even require extra care in those patient who are unconscious or cannot respond to calls or directions.

Limitations

- Small sample size
- Subjective comfort assessment
- Lack of control group

  Further randomized studies are needed to compare efficacy with commercial devices.

Conclusion

In resource-limited surgical settings, the handheld hairdryer represents a safe, effective, and low-cost alternative for the management of postoperative hypothermia[38]. When used with caution, it can support thermal regulation in the immediate postoperative period without compromising patient safety.

In our index cases. We found this useful but further research will throw more light on this device. The rewarming scheme using a household handheld hair dryer features low cost and easy accessibility. It is suitable for primary healthcare settings and has clear significance for promotion.

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Ethical approval was obtained from Hospital Ethics Committee.

Consent was obtained from patients.

Fig. 1: IMAGES OF THE HANDHELD DRIER

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