Inaccuracy of Surgical Irrigation Fluid Temperature Hand Assessment

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Introduction

- Irrigation fluids come in contact with tissue for a variable time and can directly affect the body temperature. Therefore, the recommended practice is to use euthermic fluids to be homeostatic and optimize patient care[1].
- However, there is no precise measurement method of the fluid temperature prior to use in irrigation.
- Hand-checking is the commonly used way.
- The problem with this method is its inaccuracy; it measures what is comfortable to the skin covered by the gloves, which is not close to the internal body physiologic temperature.
- Hence, the accuracy of measuring surgical irrigation fluids by hand immersion is unknown.
- Since the immediately available fluid for irrigation brought at the beginning of the procedure has been exposed to room temperature, this fluid is likely be colder than the physiologic temperature, yet it could be felt convenient by the surgical assistant[2].
- The purpose of the study is to assess the accuracy of the currently used method of checking irrigation fluid temperature by hand immersion.
- Temperature perception and judgement of the appropriateness of the fluids will be assessed objectively.
- Results from this study will help in evaluating our current clinical practice of measuring the fluid and modify it if necessary.
- The study has significant impact on the surgical practice of selecting the operative fluid temperature.

Method

- The study was done by blinded assessment of fluid temperature compared to objective (actual) measurements.
- Two sets of fluids were prepared. One of them was made at the normal body physiologic temperature (37° Celsius). The other one was adjusted for a temperature that is close to the ambient temperature comfortable to the body[3].
- Neutral temperature for naked humans ranges from 28°C. to 31°C[2]. Therefore, the fluid temperature was set at 30°C.
- Surgical technicians and circulating nurses at the local hospital were invited to voluntarily participate in the study. Participants wore gloves and immersed each of their hands in one of the two containers then chose one of the following answers for each solution:
  - **1) Appropriately warm for irrigation.**
  - **2) Too cool (cold) for irrigation.**
  - **3) Too warm (hot) for irrigation.**
- Data were collected and interpreted to evaluate perception of the surgical technicians of appropriate temperature.

Table 1. Irrigation fluid temperature perception.

	Perceived appropriate	Perceived Cold	Perceived Hot	Total
Euthermic fluid (37)	14 (52%)	0	13 (48%)	27
Cool fluid (30)	6 (22%)	19 (71%)	2 (7%)	27

Results

- Twenty-seven surgical technicians from one local hospital participated in the study.
- About half of participants perceived the normal physiologic fluid temperature as too hot for use in irrigation.
- The fluid that was 7 degrees below the physiologic temperature was perceived as appropriate and physiologic by about one fourth of participants.
- Details of the participants' perception of the fluid temperature for the two fluid types are presented in table 1.

Conclusions

- Subjective evaluation of surgical irrigation fluid temperature by hand checking is significantly inaccurate.
- Physiologic fluid temperature (euthermic) is overestimated as hot in about half of the times.
- This perception bias should be considered to address the practice of checking surgical irrigation fluid temperature before use.

References

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