Can hypothermia be prevented in a patient undergoing Abdominal surgery?

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Issues in clinical practice

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Plan

- Introduction
- Patient's profile
- Defining hypothermia
- Normal and abnormal physiology
- Biochemistry
- Pharmacology
- Effects on the patient
- Holistic Care (preventive measures)
- Conclusion

INTRODUCTION

Using an individual patient case study for reference, I will use this presentation to define the following about peri –operative hypothermia.

- Who is at risk ?
- The Causes
- The Symptoms
- How we monitor patients temperature.
- Prevention of Hypothermia.

Patient's Profile (Miss PP)

- 30 year old lady
- History of abdominal pain ?cause
- For exploratory laparotomy? proceed
- Weight-98 kg
- Temperature-35.4°C
- Pulse-90bpm,B/P-140/80mmHg
  Respiration-20 breathe per minute

Definition of Hypothermia

Hypothermia is said to exist when normal body temperature of between 35.6 and 37.8 degrees Celsius falls to 35 degrees Celsius.

(McNeil, 2003).

Categories of Hypothermia

- Mild: 32 to 35 degrees Celsius
- Moderate: 30 to 32 degrees Celsius
- Severe: below 30 degrees

(Pedley, 2002)

Maintenance of Body Temperature

The body has two sections:

- Core – this contains the organs in the skull, the chest and abdomen
- Shell – maintains vital core temperature at 37 degrees Celsius by losing or gaining heat as outside condition fluctuate

(Marieb, 2004).

How common is Hypothermia in the Peri-Operative Environment ?

As many as 70%-80% of patients undergoing abdominal surgery may suffer from post operative hypothermia

If not prevented.

(Frank et al,2006).

Most at risk patients

- Elderly
- New born and very young children
- Very ill / small body mass
- Overweight patient
- Patient with vascular problems

(McNeil, 2002).

Regulation of body temperature

- Cold body:
- Vasoconstriction
- Adrenalin release
- External temperature decrease
- Shivering triggers

- Hot body:
- Vasodilatation
- Muscle relaxes
- Hormones release decline
- Sweating
- Behaviour responds to heat (removal of clothing)

(McNeil,1998).

Altered physiology

- Skin cold
- Vessels constrict and Output increases by four to five times
- Raised pulse- 90bpm(normal-70-84bpm)
- Blood pressure-140/80mmHg(normal-110-130mmHg
- Respiration-20bpm(normal-16-18bpm)
- Shivering
- Increase oxygen intake (400%)

(Mallett and Dousherty,2000).

Factors contributing to hypothermia in theatre environment

- Patient factors-(starvation. iv fluid, body size, transfer, light gowning

  (Maloney and Odem,1999).

- Operating environment-(length/type of surgery, Anaesthesia, operating room temperature, position, abdominal opening and washout with unwarmed fluid

  (Rothrock,2003).

How heat can be lost during surgery

- Radiation- heat radiating from the body, 40-50% of total.
- Convention-warm air rising, cool air coming in, 25-30% of total.
- Conduction-as heat is lost to iv fluids, irrigation fluids and wet drapes.
- Evaporation-400kcal/hour from abdominal organs, also from prepping solutions and the respiratory tract.

(McNeil,2002)

Biochemistry

- Release of anti-diuretic hormone (ADH)
- Re-absorption from water from the kidney
- Increase respiratory rate
- Increase urine output
- Dehydration within 2 hours

(Frank et al,2002)

PHARMACOLOGY

Anaesthetic drugs used:

- Induction agent-Propofol 2-2.5mg/kg (short acting)
- Muscle relaxant-Rocuronium 0.6mg/kg(long acting)
- Maintenance-Isoflorane MAC 1.15 (Volatile gas)
- Analgesia-Fentanyl 1-50mcgs/kg and Morphine 0.05-0.1mg/kg

(Pinnock et al (2003).

Adverse Effects

- Physiological stress
- Prolong recovery
- Pressure sore
- Wound infection

(McNeil,2002).

Some warming and monitoring devices that should be used in theatres

- Bair hugger
- Anaesthetic circle breathing circuit (warming gases).
- Fluid / Blood warmer.
- Optimizing Operating Room Temperature.
- Blankets, Space blankets & Bed Sheets.
- Tympanic and Oesophageal Thermometers.

(Rothrock.2003).

Holistic Care (preventive measures)

- Assessment.
- Preparation.
- Implementation.
- Evaluation.

(AORN, 2003)

Evaluation

- With the combined multidisciplinary team approach, the perioperative risk of hypothermia should be identified and eliminated.
- Patients body temperature must be monitored and should fall within the normal range using an Oesophageal Temperature Probe or tympanic probe.
- Postoperative recovery should be uneventful.
- All hospitals and departmental polices should be adhered to.
- Nursing records should be documented.

Recommendation

- Regular teaching and updating on how to prevent hypothermia in surgical patients to be commenced.
- Feedback needed from the ward staffs.
- Theatre nurses need to attend patient pre-assessment clinic to initiate individual care planning.
- Information needed for patients with special needs to be communicated to the theatre staff as early as possible to facilitate quality individualised patient care.

(Rothrock, 2003).

Questions and answers

Have you any questions you will like me to answer about this presentation?