A systematic review on the patient related risk factors for catheter-related thrombosis

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Central Venous Catheter

- Secure vascular access

Peripherally Inserted Central Catheter

- Prevent repeated venipuncture and subsequent pain
Catheter-Related Thrombosis

- Occlusion
- Obliteration of veins

Pulmonary Embolism

Loss of Vascular Access
Remaining issues

Identification + Closer monitoring = ?Prevention
Aim of the Study

- To explore the patient-related risk factors associated with the development of a catheter-related thrombosis.
Method

Systematic Review

Search Engines: PubMed, Cochrane Library, Ovid

Search Terms: (‘upper limb deep vein thrombosis’ or ‘deep vein thrombosis’) AND (‘risk factor’) AND (‘peripherally inserted central catheter’ OR ‘central venous catheter’ OR ‘catheter’)
Inclusion Criteria

• Observational studies on patient-related risk factors for catheter-related thrombosis
• Studies with greater than 10 participants
• Articles involving humans
• Studies published in the English language
Exclusion Criteria

• Abstracts, review articles, letters, expert opinions, studies involving catheters that were not central venous catheters or peripherally inserted central catheters
• Studies that did not include patient-related risk factors
Method

Figure 1- Flowchart of identification and appraisal of studies

- Records identified on risk factors for catheter-related thrombosis through database searching (n=533)
- Additional records identified through other sources (n=0)

- Records after duplicates removed (n=482)
- Records excluded after reading title and abstract (n=449)

- Records screened (n=482)
  - Full-text articles assessed for eligibility (n=33)
    - Full-text articles excluded, with reasons (n=8)
      Did not assess patient-related risk factors n=8
  - Studies included in qualitative synthesis (n=25)
Studies

• De Cicco, 1995
• Timsit, 1998
• Decicco, 1997
• Baxi, 2013
• Aw, 2012
• Corteleszzi, 2005
• Lee, 2006
• Joks, 2014
• Richters, 2014
• Del Principe, 2013
• Chopra, 2014
• Seeley, 2007

• Evans, 2013
• Maneval, 2014
• Wilson, 2012
• Yi, 2012
• Lobo, 2009
• Gentile, 2013
• Van Rooden, 2004
• Shi, 2014
• Ahn, 2012
• Cheng, 2013
• King, 2006
• Moran, 2014
• Liem, 2012
Results
Risk Factors Investigated

- Age
- Gender
- Increased BMI
- Ethnicity
- Malignancy
- Anti-coagulation
- Thrombocytopaenia
- Personal history of thrombosis
- Diabetes
- Hypertension
- Recent surgery
- Chemotherapy
- Hormone replacement therapy
- Smoking
- Metastasis
- Trauma
- Haemoglobin
- Renal insufficiency
Lack of Consistency

- Different screening methods
- Wide variety of methods
- Lack of Definitions
Limitations

Wide heterogeneity of population groups
- Patients with head injury
- Patients in neurological ICU

Different screening methods
- Screening asymptomatic vs symptomatic patients

Bias
- Lack of sample size calculation
- Lack of blinding of assessors
- Underpowered studies
- Observational studies
Benefits

Identification + Closer monitoring = ?Prevention
Conclusion

In future...

• More robust study designs
• Larger sample sizes
• Screening all of the patients within the study
References


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