Fitting the pieces together B U R N S

Thrombosis Incidence in Major Paediatric Burns

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BACKGROUND

Major burns are associated with multiple risk factors for thrombosis such as decreased mobilisation, prolonged use of central venous lines and systemic inflammation. However, it is unclear if these may be offset by the inherent lower risk of thrombotic events in the paediatric patient.

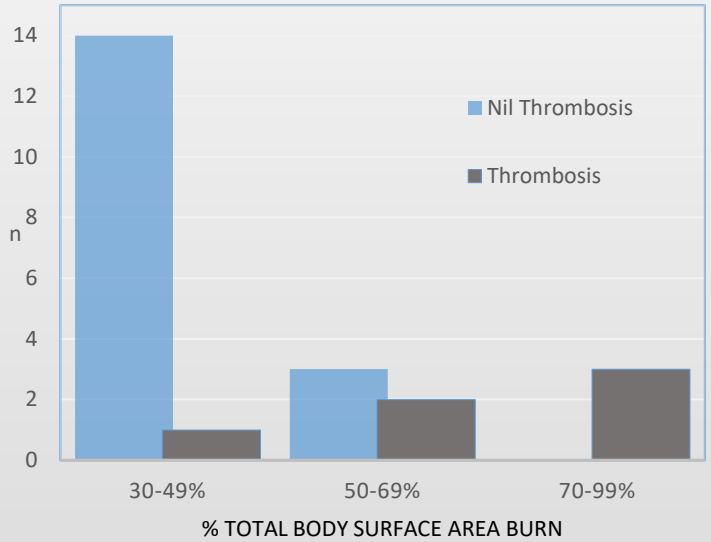
Thromboprophylaxis is now recommended in adult burns patients with a recognised deep vein thrombosis (DVT) incidence of 0.8%[1].However there is a lack of data and therefore guidance relating to the paediatric population. Large studies in this cohort are difficult to obtain with very little published on the topic. The only relevant studies were not specific to burns however did confirm the lack of data available[2,3].

This study seeks to examine the incidence of thromboembolic events and their risk factors in major paediatric burns with a view to support a hypothesis for thromboembolic prevention strategies.

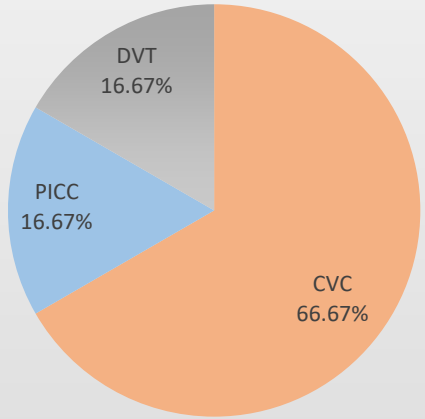
METHOD

- A retrospective audit of all major paediatric burns, defined as % Total Body Surface Area (%TBSA) ≥30%, at the WCH between 1st January 2000 and 31st December 2016.
- Coding data and the local burns database were used to identify participants with subsequent review of case files and online records.
- Exclusion criteria: Superficial burns only
  Hospital admission ≤1 day

Incidence



Thrombus Location



RESULTS

Of the cohort (n=23), 6 cases (26%) were complicated by major thrombotic events. Notably these patients had the most extensive burns averaging 68.5% TBSA. Those who developed thrombosis required longer periods of intubation, hospital admission, PICU admission, operations, and blood transfusions. These data points were more than doubled the cohort that were diagnosed with a thrombus.

All thrombotic events were significant, involving deep vessels and required enoxaparin therapy for 3 to 6 months. Of the 6 events, 4 were secondary to Central Venous Catheters (CVC) located in either the internal jugular or femoral vein, 1 was secondary to a Peripherally Inserted Central Catheter (PICC) and 1 was diagnosed clinically as a DVT to the left calf.

	Nil Thrombus	Thrombus
%TBSA Burn	42.82 (31-65)	68.5 (38-91)
Age (years)	3.88 (1-16)	8.24 (3-12)
Admission (days)	68.59 (13-260)	224.17 (78-421)
PICU (days)	7.94 (0-36)	17.4 (6-87)
Intubated (days)	4.03 (0-23)	8.4 (0-48)
OT Visits	11.35 (1-37)	38.17 (14-73)
pRBC units	3.11 (0-10)	13.67 (7-35)

DISCUSSION

This data suggests an increased risk of thrombotic events in the paediatric burns population, which is likely related to large %TBSA and the associated incidence of interventions. It is not clear how these factors individually relate to the risk of thrombosis.

The key limitation of the study is the small data set which restricts the ability to delineate individual risk factors for thrombosis in the cohort. There are also some confounding features whereby large %TBSA burns will have the associated complications that are also risk factors for thrombus formation.

Despite the limitations, this study has demonstrated a notable incidence of thrombus in paediatric burns, with potential risk factors identified. Larger studies could better delineate the contribution of these individual factors to the development of thrombotic events and therefore explore the potential benefit of targeted thromboprophylaxis in these major paediatric burns.

CONCLUSIONS

The incidence of thromboembolic events in our study was significant albeit in a small population. There is a strong association between large %TBSA and thrombus with clots mostly forming in central venous catheters.

Whilst further research is required, this study demonstrates targeted thromboprophylaxis may be required for major paediatric burns, especially in the setting of CVC requirement.

REFERENCES

1. Satahoo, SS et al. "Are burn patients really at risk for thrombotic events?" J Burn Care Res. (2015) 36(1):100-4.
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3. Hanson et al. "Effectiveness of clinical guidelines for deep vein thrombosis prophylaxis in reducing the incidence of venous thromboembolism in critically ill children after trauma" J Trauma (2012) 72(5):1292-7

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