



Clinical Outcomes of Massive Transfusion Protocols (MTP): A Comparison of MTP and Targeted MTP in Severe Trauma Patients, Hospital Sungai Buloh (2021–2022)

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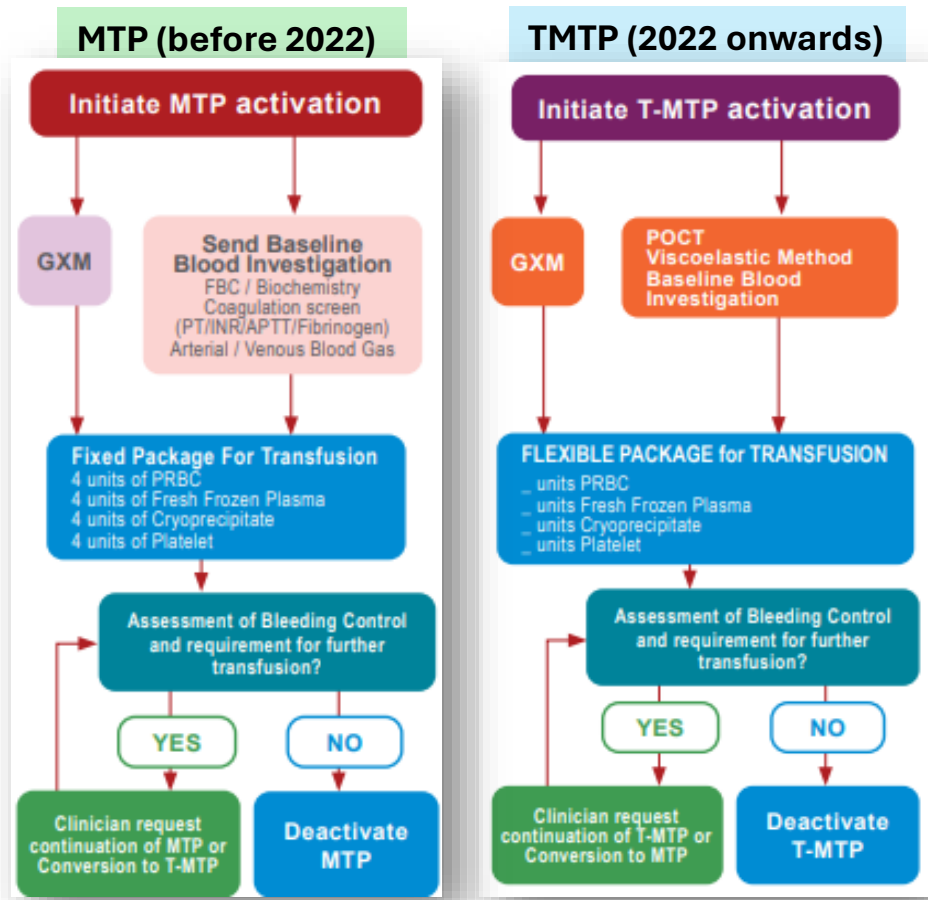


Introduction

Massive Transfusion Protocols (MTP) are widely used in trauma resuscitation to deliver red blood cells, plasma, and platelets in fixed ratios. While effective in managing hemorrhage¹, MTP **follows a standardized approach** that may not reflect individual patient needs².

Targeted MTP (TMTP) offers a more personalized strategy, **guided by point-of-care testing** to assess coagulation status and tailor transfusion therapy accordingly. At Hospital Sungai Buloh, T-MTP was introduced³ in early 2022, with activation guided by routine bedside investigations such as full blood count, venous blood gas, and INR to inform transfusion decisions.

This study compares trauma cases managed under **MTP (2021–2022)** and **T-MTP (2022)**, evaluating clinical outcomes between both groups.

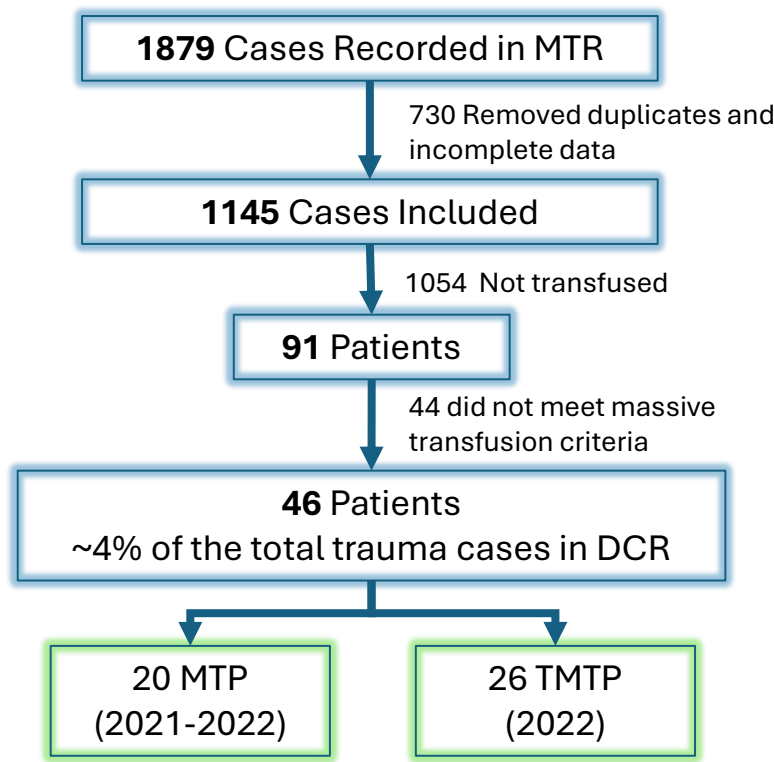


Methodology

Trauma data were extracted from the **Malaysian Trauma Registry**. Records were screened to exclude incomplete data, duplicates, and patients under 18, trauma cases treated in Damage Control Resuscitation (DCR) zone from Hospital Sungai Buloh’s Emergency Department included.

Patients transfused under MTP (2021–2022) and TMTP (2022) were analyzed. Consent was waived as the study utilized de-identified data extracted from the hospital’s trauma registry for secondary analysis.

All statistical analyses were performed using **SPSS version 29**, comparing clinical variables, transfusion details, and outcomes between groups.



Result

Variable	MTP (n=20)	TMTP (n=26)	p-value
Age (years)	41.8 ± 16.9	39.7 ± 17.4	0.612
Gender (%)	80.0% (Male)	73.1% (Male)	0.631
Mechanism of Injury	90.0%	88.5%	0.845
GCS Total	9.3 ± 4.1	12.3 ± 3.2	0.005
Shock Index (ED arrival)	1.19 ± 0.29	0.97 ± 0.26	0.017
Respiratory Rate (ED)	23.8 ± 5.9	21.1 ± 5.1	0.048

Injury % by Region (mean ± SD)			
• Head/Neck	21.7 ± 9.1	19.1 ± 8.3	0.243
• Thorax	24.9 ± 9.8	21.2 ± 8.7	0.204
• Abdomen	18.5 ± 7.5	15.3 ± 6.5	0.138
• Extremities /Pelvis	29.1 ± 10.9	30.6 ± 10.3	0.684
ISS	30.2 ± 8.7	28.3 ± 9.1	0.412
NISS	35.6 ± 9.4	33.1 ± 10.2	0.368

Surgical and Critical Care			
Surgery Performed (%)	85.0%	69.2%	0.218
ICU Admission (%)	70.0%	61.5%	0.537

Blood products utilisation, Median [IQR]				
	Packed Cell	FFP	Platelet	Cryo
MTP	4U [2-6]	4U [2-6]	4U [2-6]	2U [0-4]
TMTP	2U [1-4]	2U [1-4]	2U [1-4]	1U [0-2]
	p<0.001	p<0.001	p<0.001	p=0.024

Clinical Outcomes				
		ICU LOS (days)	Hospital LOS (days)	Complication
MTP	66.7%	6.4±3.3	14.2±5.8	25.0%
TMTP	82.6%	4.9±2.7	11.6±4.9	13.0%
	p=0.041	p=0.062	p=0.098	p=0.379

Discussion

- TMTP significantly reduced blood products utilization, aligned with findings from an Indian study⁴—while maintaining clinical outcomes.
- A statistically significant improvement in survival was observed in the TMTP group (p = 0.041), suggesting potential benefit of targeted transfusion.
- Although not statistically significant, ICU and hospital stays were shorter by 2-3 days, offering operational advantages⁵.
- Complications such as kidney failure, pneumonia, and sepsis were more common in patients receiving higher transfusion volumes⁶.
- Further research is needed to assess blood product wastage, cost-effectiveness, and long-term impact of TMTP.

Limitation

This is retrospective design, which may introduce selection bias and unmeasured confounders affecting transfusion decisions and outcomes.

Conclusion

TMTP is associated with improved survival and reduced blood product usage compared to MTP, while maintaining comparable injury severity and clinical outcomes.

Reference

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