

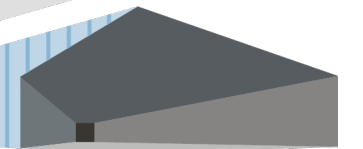
Analysis of implication of massive transfusion protocol at the Tartu University Hospital

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BaltAnestIC 2023

11th International Baltic Congress of Anaesthesiology and Intensive care
September 28–30, 2023, Tartu, Estonia

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Background

TUH is tertiary care hospital, serving population of 500 000 persons. Massive transfusion protocol was introduced in TUH in 2017 and since 2020 every MTP initiation is being protocolised by blood bank.

We conducted this study by retrospectively analysing data of activated MTPs in period of 2020 – 2022 and patients' medical health records.

Aim of this study was to:

- Describe amount of initiated MTPs during 2020 – 2022 period
- To analyse indications of MTP initiation
- Analyse amount of blood components used
- Review the demographics and outcomes of patients
- To describe logistics of blood products
- To analyse adherence to MTP guidelines of TUH

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MTP guidelines in TUH

In Tartu University Hospital after MTP initiation blood bank releases blood in shock-packs:

- 1st Shock-pack contains 4 doses of ERS – released immediately after activation
- 2nd Shock-pack contains 3 doses of ERS and 3 doses of Octaplas – released in 10 minutes after initiation
- 3rd Shock-pack contains 3 doses of ERS, 3 doses of Octoplas, 1 dose of trombocyte concentrate (~4 individual doses) – released in 25 minutes after initiation
- 4th and further packs should be negotiated with blood bank

According to TUH guidelines:

- 15-20 mg/kg (1 – 1.5 g) of tranexamic acid should be administered, within 3 hours of start of bleeding if MTP is initialized
- After initiation of MTP patients should receive calcium preparation – 1g of CaCl₂ or 3g of Ca-gluconate
- Blood products should be administered in 1:1:1 (4:4:1) ratio

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Analysis

(1) Patients, demographics, survival

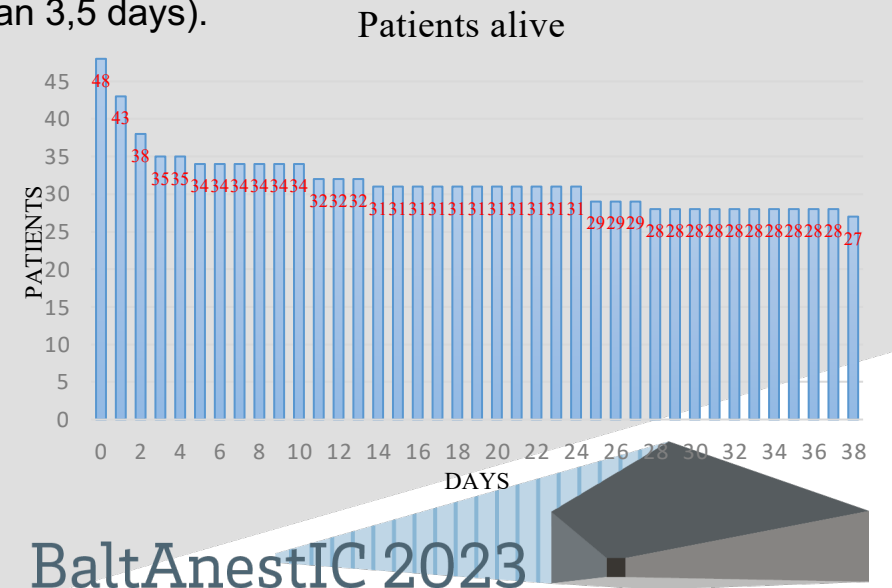
In the period of 2020 – 2022 there was 48 MTP initiated, of those patients 34 were male and 14 female.

Age ranging from 18 to 92 years old with mean age of 57 years old (SD 19), median age 60.

- 27 (56,25%) patients survived to discharge and 21 patients (43,75%) died.
- On average, patients needed 7,75 days of intensive care after MTP initiation (SD 10, median 3,5 days).

From those, who passed away:

- 3 patients (14,28%) died by exsanguination
- 17 patients (80,95%) died in ICU, 1 (4,7%) patient died in general ward
- 10 patients (47,6%) died after withdrawal of care
- On average patients died 7,6 days after MTP initiation (0 – 37, SD 11).

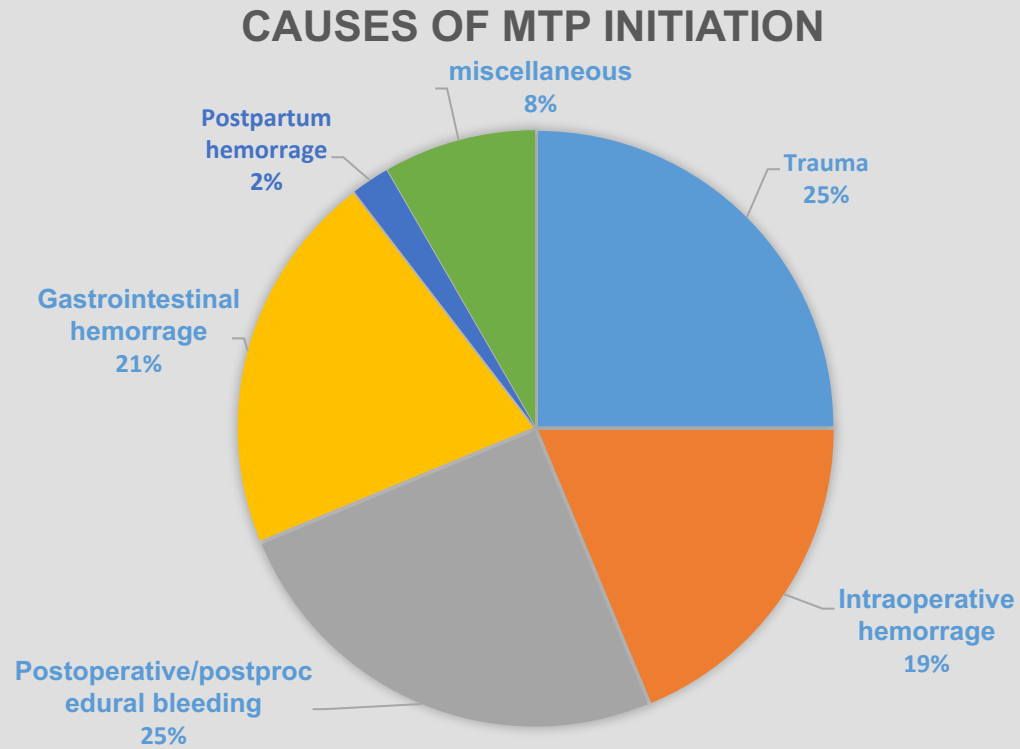


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Analysis

(2) Causes of MTP initiation

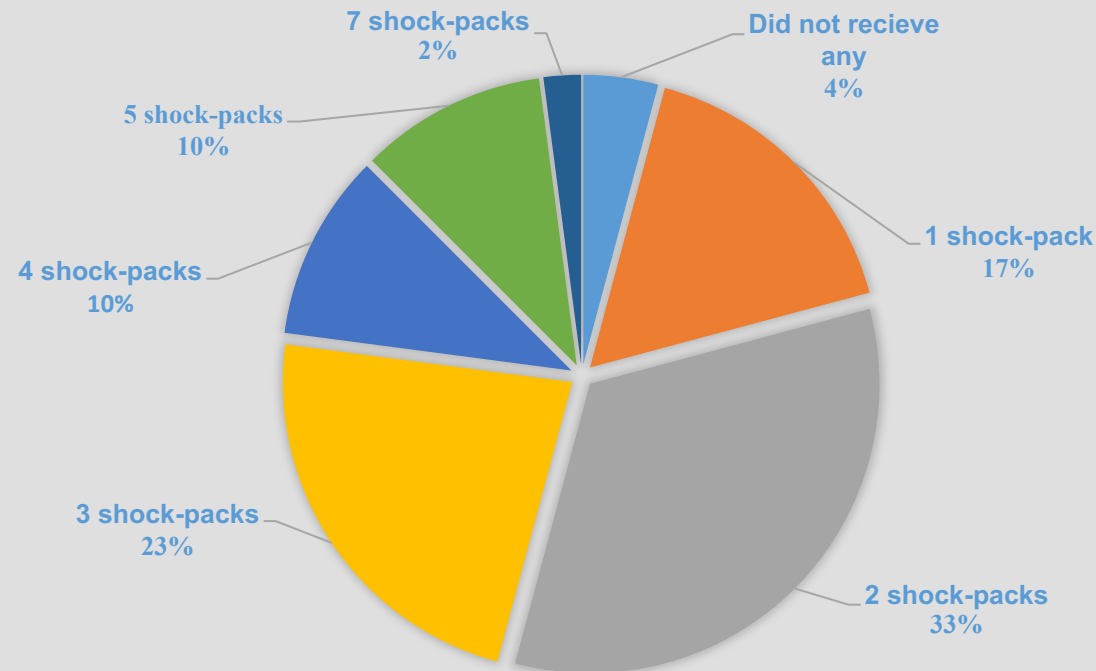


38 patients (79%) needed surgical intervention in first 24h after MTP initiation.

MTP was mostly initiated by an anesthesiologist – 26 (54%) and EM physician – 14 (29%), also 2 MTP were activated by surgeon and 2 by cardiologist.

Analysis

(3) Number of shock-packs, timing



Mean MTP duration was 1 hour 13 minutes.

Time from initiation to shock-packs:

- 1st pack released – 5 min (2-7 min)
- 2nd pack released – 18 min (13-22 min)
- 3rd pack released – 55 min (27-64 min)
- 4th pack released – 98 minutes (56-126 min)

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Analysis

(4) Amount of blood components

- RBC – patients received up to 24 doses of RBC, mean value 7,9 doses (SD 5,4), of those 3,6 (SD 4,9) doses of 0 Rh negative blood
 - In 21 cases (44%) transfusion was started with 0 Rh negative blood
- Patients received up to 19 doses of plasma products during MTP, on average 5,0 doses (SD 4,6)
- Patients received up to 6 doses of thrombocyte concentrate, on average 0,9 doses (SD 1,5)

Analysis

(5) Adherence to guidelines

TXA

- Only 29 patients (60,4%) received tranexamic acid, 28 received it during first 3 hours of bleeding
- 13 patients (27%) did not receive TXA
- There was no data on 6 patients (12,5%)

Calcium

- 34 patients (70,8%) received calcium preparations
- 9 patients (18,75%) did not receive calcium
- data was lost on 5 patients

1:1:1 ratio

- In those 16 patients who received thrombocytes, in 7 the 1:1:1 (4:4:1) ratio was achieved and in 9 was not achieved

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