nature portfolio

https://doi.org/10.1038/s41572-021-00264-3

Supplementary information

Trauma-induced coagulopathy

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Supplementary information

Table S1: Civilian studies addressing haemorrhagic deaths

Studies	Year(s) covered by study	Setting	% blunt trauma	% of pre-hospital deaths due to haemorrhage	% of in-hospital deaths due to haemorrhage
Sauaia et al. [1]	1992	Population-based Denver, CO	51%	36%	41%
Shackford et al. [2]	1992	Population-based S. Diego, CA	71%	31%	
Stewart et al. [3]	1995-2001	Hospital-based S. Antonio, TX	71%	NA	21% *
Tien et al.[4]	1999-2003	Hospital-based Toronto, Canada	87%	NA	15%
Evans et al. [5]	2005	Population-based Newcastle, Australia	86%	33%	
Consunji et al.[6]	2004-2007	Hospital-based Manila, Philippines	41%	NA	28%
Soreide et al. [7]	2010	Population-based Stavenger, Norway	87%	12.5% ***	12.5%***
Kahl et al.[8]	2000-2011	Hospital-based S. Diego, CA	69%	NA	28%
Kleber et al. [9]	2010	Population-based Berlin, Germany	87%	14% #	4% #
Trajano et al. [10]	1995, 2000, 2005, 2010	Hospital-based Campinas, Brazil	73%	NA	18%
Davis et al.[11]	2011	Population-based Miami-Dade County, FL	53%	34%	NA
Roberts et al.[12]	2005-2013	Hospital-based Calgary, Canada	94%	NA	27%
Arslan et al.[13]	2010-2013	Hospital-based Ankara, Turkey	85%	28% ¥	29%
Oyeniyi et al. [14]	2005-2006 and 2012-2013	Hospital-based Houston, TX	81-80%	NA	2005-2006: 36% 2007-2013: 25%
Drake et al.[15] **	2014	Population-based Harris County, TX	62%	20%	20%
Jochems et al. [16]	2007-2016	Hospital-based Utrecht, Netherlands	98%	NA	2007-2012: 9% 2013-2016: 3%
Callcut et al. [17]	2015-2017	Hospital-based 18 centers across US	73%	NA	23%

**Attributed to shock; **18% of the trauma-related deaths occurred after the index hospitalization, of which 5(1%) were attributed to hemorrhage; ***authors estimation based on the time from injury to death reported in original study; # definition excludes "polytrauma deaths"; ¥ death at scene or during transport but transported to the hospital*

Table S2: Epidemiologic studies of trauma-induced coagulopathy (TIC) since 2000

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Raum et al.[18]	2001	1993-1999	PT<60% than normal plasma	1351 adult trauma patients with ISS>15, multicenter	Germany	NA	30	NA	27%	47%	ED	NA	ISS, hypoperfusion
Keller et al.[19]	2001	1999-2000	INR>1.2	56 children with blunt TBI, single center	US	100%	NA	NA	38%	35%	ED	TBI	GCS<=9
Brohi et al. [20]	2003	1993-1998	PT>18s, PTT>60s, TT >15s (1.5 x normal)	1088 helicopter-transported patients, single center	United Kingdom	75%	20	18%	24%	46%	ED	TIC less frequent in isolated TBI	hypoperfusion
McLeod et al. [21]	2003	1995-2000	PT>14s or PTT>34s	10,790 injured adults, single center	US	NA	9	12%	28%	19%	ED	NA	NA
Carrick et al. [22]	2005	2001-2003	PT>14.2s or PTT > 38.4s	184 adults with blunt TBI, single center	US	100%	17		21% upon admission, 41% within 72hours	62%	ED and 72 hours	severity of TBI associated with TIC	Severity of TBI
Affonseca et al. [23]	2007	1998-2003	Prothrombin activity < 70%, PT>16s, PTT 10s>control time, platelets< 150,000/mm^3	301 children with blunt TBI	Brazil	100%	NA	27%	76%	40%	ED	TIC correlated with TBI severity, TIC not related to extra cranial injuries	Severity of TBI
Rugeri et al. [24]	2007	2004	INR>1.6 or PTT>60s or platelets< 100,000/mm^3 or fibrinogen <1g/L	88 adults admitted to TRU, single center	US	NA	22	NA	28%	NA	TRU	NA	NA

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Maegele et al. [25]	2007	2007 (period not specified)	PT (Quick's value) <70%, platelets <100,000 mm^3	8724 adults, multicenter	Germany	96%	30 in TIC; 21 in non-TIC	NA	34%	28%	ED	TIC less frequent in isolated head	ISS, pre-hospital fluids
Niles et al. [26]	2008	2003-2004	INR>=1.5	347 combat patients who received RBC, single combat support hospital	US-Iraq conflict	8%	17	25% required massive transfusion	38%	24%	admission	NA	NA
Kashuk et al. [27]	2008	2001-2006	INR>1.5	133 adults who received >10 units RBC in 6 hours, single center	US	56%	36	100%	30%	NA	first 6hours post hospital admission	NA	ED temperature <34°C
Talving et al. [28]	2009	2005-2007	platelets < 100,000/mm^3, INR>1.1, PTT>36s	436 adults with TBI	US	32-33%	NA	4%	36% all TBI, 34% in isolated TBI	49%	ED	TBI	GCS<8, cerebral edema, SAH, midline shift
Frith et al. [29]	2010	2007-	INR>1.2 and INR>1.5	3646 adults, multicenter	United Kingdom, Germany, Netherlands, Norway, US	90%	22	24%	INR>1.2 36%; INR>1.5 19%	INR>1.2 23%; INR>1.5 28%	ED	NA	Combination of tissue injury and Shock
Wafaisade et al. [30]	2010	1993-2007	PT (Quick's value) <70%, platelets <100,000 /mm^3	3,114 adults with blunt, isolated TBI, multicenter	Germany	100%	TIC 25 non-TIC 21	Median SBP (mmHg): TIC: 125 non-TIC 134	23%	50%	ED	Isolated TBI	age>=75yrs, pre-hospital fluids>=2000ml, shock at scene or ED, GCS<9 at scene, AIS head

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Wafaisade et al. [31]	2010	2002-2007	PT (Quick's value) <70%, platelets <100,000 /mm^3	1987 adults with ISS>15, multicenter	Germany	95%	TIC 36 non-TIC 28	Median SBP (mmHg) TIC: 104 non-TIC: 123	36%	26%	ED	NA	ISS, AIS abdomen, shock at scene or ED, ratio of prehospital colloids: crystalloids ≥1:2. prehospital fluids ≥3000 ml
Dirks et al. [32]	2010	2001-2003 and 2005-2007	PTT>35s	253 adults who required >=1 red blood cells unit, single center	Denmark	85%	2001-03: 20 2005-07: 24	NA	PTT 2001-03: 27% 2005-07: 34%	49%	ED	NA	NA
Jeger et al. [33]	2010	2007-2008	INR>1.5 and PTT>60s or TT>15s	172 adults with ISS>15, single center	Switzerland	NA	25	NA	33%	NA	ED	NA	NA
Tauber et al. [34]	2011	2005-2008	FIBTEM MCF<7mm, EXTEM MCF<45mm, EXTEM CFT>200s, EXTEM CT>100s, fibrinogen <150mg/dL or INR> 1.5 or PTT> 50s, platelets< 100000/mm^3	Adults with polytrauma patients, single center	Austria	100%	34	16%	26% fibrinogen <150mg/L, 30% impaired fibrin polymerization, 22% reduced clot firmness INR>1.5 14%, 7% hyperfibrinolysis	Hyperfibrinolysis 57%; FIBTEM MCF<7mm 21%, EXTEM>100 s 46%, EXTEM CFT>200 s 27%, EXTEM MCF<45 mm 25%	ED	Hyperfibrinolysis associated with abdominal trauma	TBI, abdominal trauma (hyperfibrinolysis), acidosis, hypothermia, hypoperfusion, ISS
Johansson et al. [35]	2011	2010	PTT > 35s, INR > 1.2	80 adults, single center	Denmark	91%	17	Median shock index 0.62	15%	50%	ED	NA	ISS, hypoperfusion

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Greuters et al. [36]	2011	2003-2007	PTT >40s, INR >1.2, platelets <120,000 /mm^3	107 adults with isolated TBI	Netherlands	93%	25	NA	ED: 24%; 24 hours postinjury: 40%	NA	ED, 24 hours postinjury	Isolated TBI	NA
Patregnani et al. [37]	2012	2002-2009	INR>=1.5	744 children in US combat support hospitals in Iraq and Afghanistan	U.S. combat support hospitals in Iraq and Afghanistan	17%	10	38%	27%	22%	ED	NA	ISS, shock
Hendrickson et al. [38]	2012	2006-2010	PT >15.9s, PTT >42.1s, fibrinogen <180 mg/dL, platelets <185,000 /mm^3	102 children requiring blood products, single center	US	80%	20	NA	77%	NA (increased mortality odds associated with abnormal PT, PTT, and platelet count, but not fibrinogen)	ED	TBI	ISS, GCS
Mitra et al. 25 [39]	2012	2005-2008	INR >1.5 or PTT >60 s	772 adults with ISS>15 who required >=1 red blood cells unit, single center	Australia	92%	29	37% required massive transfusion	25%	38%	ED	NA	NA
Peiniger et al. [40]	2012	2002-2008	PT test (Quick value) <70%; PTT >38s, platelets <100,000 /mm^3	200 children with isolated blunt TBI, multicenter	Germany	100%	NA (51% GCS<=8)	38%	GCS<=8: 44% GCS>8: 14%	GCS<=8: 52%	ED	TBI	GCS<=8

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Genét et al. [41]	2013	NA	INR>1.2, PTT> 35s	80 adult trauma patients, single center	Denmark	91%	17	median shock index 0.62	TBI+other trauma: 47% isolated TBI13% non-TBI 5%	NA	ED	NA	NA
Chhabra et al. [42]	2013	2008-2010	INR>1.5 and PTT>1.5 x control time	208 adults with isolated TBI, single center	India	NA	NA	NA	46%	30%	ED and 72 hours	effaced basal cisterns on CT scan	GCS ≤ 8, effaced basal cisterns on CT scan, Hemoglobin <10 g/dl and D-dimer>1 µg/dl
Xu et al. [43]	2013	2008-2009	PT > 18s, INR>1.6, PTT > 60s	223 adults with blunt trauma, ISS>15, single center	China	100%	33	14% base deficit>6mEq/L	23%	37%	ICU		Base deficit>=6 mEq/L, GCS<=8, platelet count
Alexiou et al. [44]	2014	2008–2012	PTT>40s, INR >1.2, platelet <120,000 /mm^3	149 adults with isolated TBI	Greece	NA	NA	NA	23%	NA	24 hours postadmisson	Isolated TBI	Glucose >151 mg/dl, Hemoglobin<12.4 mg/dL
Neal et al. [45]	2014	2003–2010	INR>1.5	1897 adults with blunt trauma, multicenter	US	100%	34	52%	22%	NA	ED	NA	Time from injury, age, hypoperfusion, serious comorbidity
MacLeod et al. [46]	2014	2008-2009	PT>13.3s	701 adult trauma patients, single center	US	74%	9	Pre-hospital median SBP 130 mmHg	16%	9% in PT 13.4–15.5s; 26% in PT 15.6–17.5s; 33% in PT 18–20s; 36% in PT>20s	ED	NA	TBI, ISS and hypotension

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Moore et al. [47]	2014	2010-2013	TEG LY30: hyperfibrinolysis (≥3%)	180 adults with ISS>15, single center	US	79%	29	Median SBP 104mmHg	Hyperfibrinolysis 18%	Hyperfibrinolysis 45%	field or ED	NA	NA
Tonglet et al. [48]	2014	2012-2013	20% abnormality in ROTEM, INR >1.3, or fibrinogen <150mg/dL at admission or 3 hours later.	82 adults with severe blunt trauma, single center	Belgium	100%	13	13%	13%	55%	ED	NA	NA
Kutcher et al. [49]	2015	2003-2011	INR>1.2	1,537 adults with blunt trauma and hemorrhagic shock, multicenter	US	100%	33	65%	38%	23%	ED		Age<20yrs, GCS, transport time, ISS, lower pH, lower temperature, 2-4L of pre-hospital fluids if high lactate, >4 L pre-hospital fluids regardless of lactate
de Oliveira et al. [50]	2015	2007	INR> 1.5, PTT > 60s, platelets< 100,000/mm^3	345 adults with ISS>15, single center	Canada	NA	Isolated TBI: 21 TBI+other injuries: 37 No TBI: 25	NA	Isolated TBI: 13% TBI+other injuries: 31% No TBI: 23%	Isolated TBI: 66% TBI+other injuries: 48% No TBI: 19%	ED		ISS, severe trauma with no TBI, hypoperfusion

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Peltan et al. [51]	2015	2003-2010	INR>1.2 and INR>1.5	1031 adults with blunt trauma requiring >=1 RBC, multicenter	US	100%	33	23%	50% INR >1.2 and 21% INR >1.5	19% INR >1.2 and 27% INR >1.5	ED	Femur fractures associated with INR>1.5	Age, hypotension, ISS, APACHE II, BMI, lung contusion, femur fracture
Khan et al. [52]	2015	2009-2013	ROTEM CA5 ≤ 35 mm	106 trauma patients who received >3 RBC, multicenter	UK, Norway, Denmark, Germany, Netherlands	87%	34	46%	40%	NA	ED	NA	NA
Hagemo et al. [53]	2015	2007-2011	INR>1.2	808 adults, multicenter	UK, Denmark and Norway	82%	16	6% required massive transfusion	11%	NA	ED	NA	NA
Holcomb et al.[54]	2015	2012-2013	INR>1.5	680 adults who required >=1 red blood cells unit, multicenter (RCT)	US	53%	26	39%	17%	NA	ED	NA	NA
Strumwasser et al. [55]	2016	2004-2009	INR>=1.5, PTT> 36s, platelets <100,000 /mm^3	20,126 (7.6% pediatric, 92.4% adult) trauma patients, single center	US	87% in children; 77% in adults	ISS>15:15% children;17% in adults	0.8% in children; 3% in adults	5.8% in children and 8.4% in adults	14% in children and 18% in adults	ED	TBI associated with TIC especially in the elderly	TBI, age, hypoperfusion, tissue injury
Peltan et al[56]	2016	2008-2013	INR >1.5	Derivation: 1963 adults with blunt trauma, multicenter; Validation: 285 adults with blunt	US	100%	no TIC 17, TIC 26 (derivation) and 32	Derivation: 28% SBP<130mmHg; Validation: 37% SBP<117mmHg	Derivation 6%; Validation 9%	Derivation 46%	ED	NA	Injury severity and hypoperfusion

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
				trauma, single center			(validation)						
Moore et al. [57]	2016	2010-2013	Hyperfibrinolysis (HF) (LY30 >=3.0%)	2540 adults with ISS>15, multicenter	US	83%	25	19%	18% with hyperfibrinolysis	Hyperfibrinolysis 34%	ED	NA	Hypotension, penetrating mechanism and higher ISS
David et al. [58]	2017	2011-2015	Fibrinogen <150mg/dL, INR> 1.5, platelets <100,000 /mm^3	485 adult trauma patients	France	93%	26	Median shock Index 0.76	23%	54%	ED	NA	Vasopressor administration, ISS, shock index, fluid volume
Koami et al. [59]	2017	2013-2015	JAAM DIC criteria>3	72 adults with blunt trauma, single center	Japan	100%	29 TIC, 12 non-TIC	8%	29% (patients with anti-coagulants and with liver disease not excluded)	19%	ED	NA	shock, ISS, fluid volume
Mistral et al. [60]	2017	2015-2016	INR>1.1	98 adults with severe trauma (shock, transfusion or high risk injuries)	France	88%	NA	19%	53%	25%	ED	NA	NA
Mador et al. [61]	2017	2007	INR>1.5, Abnormal TEG	628 adult trauma patients, single center	Canada	96%	25	28% required transfusion/ first 24 hours	Abnormal TEG 13% INR>1.5	NA	ED	NA	Older age

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Liras et al. [62]	2017	2010-2016	TEG: ACT≥128s, angle ≤65^{o} , MA ≤55 mm, LY30≥3%	956 children with severe trauma, single center	US	72%	14	SBP TIC 120mmHg non-TIC 122mmHg	Overall 57%; TBI 62%; Age<=5yrs 65%	Overall 12%; TBI: 31%; Age<=5yrs: 11%	ED	No differences in injury patterns between TIC and non-TIC	Overall: field intubation, ED hypotension; TBI: head AIS, field and ED hypotension; Age<=5yrs: ED hypotension
Moore et al. [63]	2018	2014-2017	INR>1.3; Abnormal TEG (ACT>128s, MA<55mm, Angle<65^{o}, LY30>3%)	125 adult trauma patients with pre-hospital shock, single center (RCT)	US	50%	27	100%	Field: INR>1.3 6%; Abnl TEG 44% ED: INR>1.3 34%; Abnl TEG 56%	Field INR>1.3 0; Abnl TEG 0 ED: INR>1.3 32%; Abnl TEG 20%	Field and ED	NA	NA
Dwivedi et al. [64]	2018	2015-2016	Platelets <100,000/mm^{3}, bleeding or clotting time> lab upper range, INR>1.5, PTT>10s above control, D-dimer >0.5 mg/l, and FDP >10 mg/l	152 adults and 48 children with TBI, single center	India	97% in adults, 96% in children	NA	NA	Adult 61%; Children 29%	Adult 63%; Children 50%	ED	TBI	GCS<=8
Sperry et al. [65]	2018	2014-2017	INR>1.3; Abnormal TEG (ACT>128s, MA<55mm, Angle<65^{o}, Hyperfibrinolysis LY30>3%)	501 air-transported adults in shock, multicenter (RCT)	US	82%	22	100%	INR>1.3 45%; Abnl TEG 59%	ED: INR>1.3 34%; Abnl TEG 29%	ED	NA	NA

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Fröhlich et al. [66]	2019	2002-2013	Quick's value < 70%, platelets < 100,000/mm^3	61,212 adults, multicenter	Germany	95%	22 in 2002 and 18 in 2013	Mean ED SBP 124mmHg in 2002; 132mmHg in 2013	25%	NA	ED	NA	NA
Baksaas-Aasen et al. [67]	2019	2008-2014	INR > 1.2	2287 trauma activation patients, multicenter	6 major trauma centers in 5 countries: United Kingdom, Denmark, Germany, Netherlands, Norway	85%	13	15% required >3 RBC/12 hours	7%	NA	ED	NA	NA
Sumislawski et al. [68]	2019	2011-2017	Conventional: INR ≥1.4 and/or PTT ≥35 s TEG: ACT >128 s, angle <65°, or MA <55 mm	839 trauma activation patients, multicenter	US	51%	17	Base deficit between 4 (no TIC) and 7mEq/L (TIC)	33%	26%	ED	TBI associated with TIC	NA
Ishii et al. [69]	2019	2013-2015	Fibrinogen <130mg/dL, D-dimer >=118μg/mL	666 adults with blunt trauma, multicenter	Japan	100%	26	20%	17%	44%	ED	TBI more frequent in TIC	Overall: field intubation, ED hypotension; TBI: head AIS, field and ED hypotension;

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Albert et al. [70]	2019	2014-2016	INR) ≥ 1.27, PT ≥ 16.7s, PTT ≥ 28.8s	120 patients with isolated TBI, age 20-50 years, single center	India	NA	NA	28%	42%	44%	ED	NA	NA
Samuels et al. [71]	2019	2014-2018	TEG ACT>128 s, MA <55 mm, angle <65°; LY30 > 7.6% . Conventional coagulation assays: INR>1.3 and PTT>30s	572 trauma activation patients with New Injury Severity Score>8, single center	US	82%	NISS 25 to 43 depending on absence/presence TBI	Median SBP 105 to 134mmHg depending on absence/presence of SBP	23% INR>1.3; 32% PTT>30s; 37% ACT>128 s; 19% MA<55mm; 19% Angle<65°; 10% Hyperfibrinolysis	NA	field or ED	Isolated TBI associated with delayed clot formation	TBI associated with delay in clot initiation, fibrin cross-linking, hypofibrinogenemia, deficiencies in the intrinsic pathway, no abnormalities in fibrinolysis
Leeper et al. [72]	2019	2015-2019	hyperfibrinolysis LY30 >=3.0%	285 children, single center	US	75%	17	4%	19% with hyperfibrinolysis	Hyperfibrinolysis 32%	ED	NA	NA

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
Cohen et al.[73]	2019	2012-2013	INR > 1.2, EXTEM A5 <=35mm, EXTEM LI30 < 97%	40 patients: US and Coalition military personnel identified as having war injuries resulting in activation of DCR	Craig Air Force Theater Hospital – Bagram, Kandahar NATO Hospital in the Afghanistan Theater	IED 80%; rocket propelled grenade 8%	22	100%	70%	NA	ED	NA	NA
Thorn et al. [74]	2019	2012-2016	INR > 1.5 or PTT > 60s	15370 adults with ISS>15, multicenter	Germany	93%	25	Median SBP TIC 116mmHg non-TIC 130mmHg	11%	NA	ED	NA	Modified COAST score: on-scene > 45 min or pre-hospital time > 90 min; low prehospital SBP; low ED temperature; pre-hospital thorax drain; abdominal AIS > 3.
Reed et al. [75]	2019	2012-2017	Age-adjusted abnormal values of INR, PTT and fibrinogen	156 children (<14yrs), 1524 adults, 303 older adults (>=65years), single center	US	75%	17	Median Base Excess -3 mEq/l	Abnormal INR 37%; Abnormal PTT 6%; Abnormal fibrinogen 24%	Abnormal INR 14%; Abnormal PTT 52%; Abnormal fibrinogen 15%	ED		Penetrating injury, ISS, Hematocrit, age<14yrs or >=65yrs
Nair et al. [76]	2020	2006-2015	INR>1.2	545 pediatric polytrauma patients, single center	US	91%	TIC ISS 25; non-	NA	16%	26%	ED	NA	Non-blunt trauma (penetrating or

Study	Publication year	Study period	TIC definition	Population	Country	Blunt trauma	ISS	Hypotension/Shock	TIC Incidence	TIC Case-fatality	Timing of TIC	Injury pattern	Risk Factors for TIC
							TIC ISS 9						unknown), ISS
Driessen et al. [77]	2020	2009-2016	Quick's value < 70% (INR > 1.4) or PTT ≥ 40 or platelet ≤ 100,000/mm^3	733 children, multicenter	Germany	92 to 97%	27 to 36	NA	14%	42 to 49%	ED	TBI	NA
James et al. [78]	2020	2010-2016	Age-adjusted abnormal values of INR, PT, PTT and platelets	155 children with isolated, blunt TBI, single center	Singapore	100%	16	14%	21%	24%	ED	Isolated TBI	AIS head, hypotension at triage

Quick's value of 70% equates to an INR of 1.4[66] ; AIS: Abbreviated Injury Scale; APACHE II: Acute Physiology and Chronic Health Evaluation Score II; BMI: body mass index; ED: emergency department; FDP: fibrin degradation products; GCS: Glasgow coma scale; ISS: injury severity score; NA: not available; PT: prothrombin time; PTT: activated partial thromboplastin time; SAH: subarachnoid hemorrhage; TBI: traumatic brain injury; TRU: trauma resuscitation unit; TT: thrombin time.
JAAM DIC criteria: (1) SIRS ≥3 points, (2) platelet <80,000/mm^3 or (3) platelet <120,000/mm^3, (4) INR ≥1.2, (5) fibrinogen and fibrin degradation products (FDP) ≥25 μg/mL or (6) FDP ≥10 μg/mL

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