**Supplementary Table 1. Studies investigating coagulation in both venous and arterial blood obtained from humans (number of studies, n=29)**

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| --- | --- | --- | --- | --- |
| **Author (year)** | **Study population** | **Sampling sites (needle size)**  **Sampling time** | **Laboratory analyses** | **Results** |
| Naimi et al. (1963) [1] | Atherosclerosis, n=68  Mean age: 56 y  Male: 42 (62%)  Healthy, n=28  Mean age: 27 y  Fibrinolysis in all, coagulation in 20 patients and 16 healthy | Brachial artery (19G)  Antecubital vein (19G)  Time: 9-9.30 AM (after fasting) | PT, FII, FV, FVII/X, thromboplastin generation, heparin tolerance, Stypven time, platelet count, fibrinogen, fibrinolysis (euglobulin precipitation) | Healthy:  PT: A  Heparin tolerance test: A  Thromboplastin generation: A  Fibrinolysis: A  FII, FV, FVII/X, Stypven time, platelet count, fibrinogen: 🡪  Similar results, though less pronounced, in the atherosclerotic group |
| Chakrabarti et al (1963) [2] | Volunteers, n=11,  Hereof atherosclerotic, n=7 | Brachial artery  Antecubital vein | Fibrinolytic activity (dilute clot lysis time) | Fibrinolytic activity: 🡪 |
| Ozsoylu et al. (1969) [3] | Cardiac surgery for septal defects, n=4  Healthy, n=14 | Brachial artery  Antecubital vein  Time: Before heparin | PT, PTT, FII, FV, FVII/X, FXIII, FVIII, fibrinogen, platelet count | FVIII: A  Fibrinogen: A  PT, PTT, FII, FV, FVII/X, FXIII, platelet count: 🡪 |
| Saveleva et al. (1976) [4] | Coronary atherosclerosis or rheumatic heart disease, n=179  Healthy, n=50 | Brachial artery  Antecubital vein  Time: Morning (after fasting) | Blood coagulation time, re-calcification time, heparin tolerance, prothrombin utilization, prothrombin index, fibrinogen, fibrinogen B, fibrinase activity, PT, free heparin, euglobinolysis time, natural lysis, clot retraction and density, platelet adhedsivity, platelet count, plasmin, plasminogen activator, plasminogen proactivator, plasminogen, antiplasmins | Healthy:  Coagulation time: A  Re-calcification time: A  Heparin tolerance: A  Euglobinolysis: A  Plasminogen activator: A  Prothrombin utilization and index, fibrinogen, fibrinogen B, fibrinase activity, PT, free heparin, euglobinolysis time, natural lysis, clot retraction and density, platelet adhedsivity, platelet count, plasmin, plasminogen proactivator, plasminogen, antiplasmins: 🡪  Similar results, though less pronounced, in the heart disease group |
| Haines et al. (1979) [5] | Ischemic heart disease undergoing catheterization, n=31 | Femoral artery  Pulmonal artery  Femoral vein (n=10)  Time: Before heparin | FII, FV, FVII, FVIII, FX, fibrinogen, AT, fibrinolytic activity (dilute clot lysis time) | FII, FV, FVII, FVIII, FX, fibrinogen, AT, fibrinolytic activity: 🡪 |
| Aviram et al. (1987) [6] | Healthy males, n=10 | Radial artery  Antecubital vein (20G)  Time: 8AM (after fasting) | Platelet aggregation (agonist collagen). Serotonin release, beta-TG | Platelet aggregation: A  Serotonin release: A  Beta-TG: A |
| Haynes et al. (1992) [7] | Patients in ICU, n=39  Hereof n=9 having received heparin treatment  With and without coagulopathy or AC treatment | Indwelling A cannula (20G, flushed with heparin 2u/mL 3-5mL/hour)  Venepuncture in another limb  A and V discard: 5.6 mL | APTT, PT, TT, fibrinogen, heparin | APTT: A (due to heparin flush)  TT: A (due to heparin flush)  PT, fibrinogen: 🡪  Heparin in 50% A samples:  APTT: A  TT: A  9 heparin-treated patients: no V-A differences in APTT |
| Mundal et al. (1993) [8] | Fertile normotensive females, n= 19  Fertile hypertensive females, n=18  Mean age: 40 y | Radial artery (venflon 1.2 mm)  Cubital vein (venflon 1.4 mm)    A and V discard: 2 mL  Time: Baseline and after cold pressor test | Beta-TG, platelet count | Baseline normotensive+ hypertensive  Beta-TG: A  Platelet count: 🡪 |
| Blann et al. (1996) [9] | Diagnostic angiography, n=22 | Iliac artery  Antecubital vein  Time: Immediately after insertion of angiographic catheter | PT, APTT, fibrinogen, vWF, tPA, tPA/PAI, soluble selectin, D-dimer | tPA/PAI: A  PT, APTT, fibrinogen, vWF, tPA, soluble selectin, D-dimer: 🡪 |
| Heap et al. (1997) [10] | ICU-patients, n=79  Age >18 y, no heparin 24 h before | An indwelling line (flushed with 1IU/mL heparin 3-4 mL/hour)  Venepuncture  A discard:  Sample 1: 4.5 mL  Sample 2: 16 mL | APPT, PT, fibrinogen, reptilase time, TT  If A APTT >10% prolonged -> anti-Xa assay | 1. A sample:  APTT: A (due to heparin flush)  TT: A (due to heparin flush)  2. A sample:  APTT: A (due to heparin flush)  TT: A (due to heparin flush)  PT, fibrinogen, reptilase time: 🡪 |
| Rubens et al. (1998) [11] | Cardiac surgery, n=8  No major systemic illness, AP antifibrinolytic or AC treatment, re-operative surgery, pre-op coagulation/ platelet abnormality | Radial artery (2G)  Peripheral vein (14G)  CVC  A and CVC discard: 10 mL  Peripheral V discard: 2 mL    Time: Before anaesthesia | Platelet flow cytometry: GPIb, GMP-140, thrombospondin, GPIIb/IIIa, FXIIIa | FXIIIa: A  GPIb, GMP-140, thrombospondin, GPIIb/IIIa: 🡪  Individually activity in A blood |
| Li-Saw-Hee et al. (1999) [12] | Percutaneous balloon mitral valvuloplasty, n=25  Mean age: 60 y  Males: 5  Warfarin treatment (INR 2-3) paused 2 days before  INR 1.7 +/- 0.2 | Femoral artery  Femoral vein  Time: Before heparin | D-dimer, fibrinogen, soluble selectin, beta-TG, soluble thrombomodulin, vWF | D-dimer, fibrinogen, soluble selectin, beta-TG, soluble thrombomodulin, vWF: 🡪 |
| Woller et al. (1999) [13] | Peripheral arterial occlusive disease, n=22  Mean age: 63.1 y  Males: 16 (73%) | Femoral artery from affected leg  V. intermedia cubiti venepuncture | F1+2, D-dimer, TAT | TAT: A  F1+2: A  D-dimer: 🡪 |
| Peverill et al. (2000) [14] | Percutaneous balloon mitral valvuloplasty, n=36  Normal INR, n= 29 Prolonged INR, n=7 | A and V sampling  Time: Baseline | F1+2 | F1+F2: 🡪 |
| Manspeizer et al. (2001) [15] | Cardiac surgery, n=39  Mean age: 68 y  Males: 76% | Intra-arterial catheter  Internal jugular vein SI. Both flushed with 0.9% sodium chloride  A and V discard: 10 mL  Time: Before and after anaesthesia, after heparin, after 60 min of CPB, at the end of CPB, after protamine, end of surgery, and 1. postop day (total paired samples, n=105) | TEG: R, MA, α-angle*,* K, LY30 | TEG:  R: A  α-angle:A  MA: A  K: A  LY30: 🡪  Abnormal values  MA>45 mm: V 38% - A 20% \*  R>20 mm: V 9% - A 1% \* |
| McLaren et al. (2001) [16] | Haemodialysis n=33  Age range: 18-85 y  Males: 15 | A bloodline in haemodialysis circuit, catheters flushed with 20.000 U heparin (n=2, 10.000 U)  Peripheral venepuncture  CVC  A discard: 25 mL  CVC discard: 5 mL  Time: 15 min after start of haemodialysis before heparin | INR | INR: 🡪  Correlation coefficient  Peripheral venous – CVC: R2=0.97 \*  Peripheral venous – arterial: R2=0.99 \* |
| Frumento et al. (2002) [17] | Cardiac surgery, n=39  Mean age: 66 y  No preop INR>1.2 | Radial artery (20G)  CVP  V: SI  Flushed with 0.9% sodium chloride  Discard: 10 mL  Time: After anaesthesia, after protamine, end of surgery | TEG: R, MA, α-angle*,* K, LY30 | R: A  α-angle:A  MA: A  K: A  LY30: 🡪  CVP: R and MA more than A blood |
| Murshid et al. (2002) [18] | Head injury (ICU), n=17  Mean age: 26 y  Males: 15  (n=9 with other injuries). | Line in radial artery  Peripheral venepuncture  Line in internal jugular vein  Time: At admission + every 24 h up to four days post-injury | PT, APTT, TCT, fibrinogen, F1+2, TAT, D-dimer, FVII, AT, protein S and protein C | Mean +/- sd. V - A, no p-values  PT (s): 24.3 +/- 3.9 vs 23.5 +/- 4.4  PT (%): 147.7 +/- 23.3 vs 144.3 +/- 26.1  APTT (%): 110.1 +/- 21.3 vs 106.7 +/- 16.7  TT (%): 104 +/- 16 vs. 105 +/- 16.9  Fibrinogen (g/dl): 2.51 +/- 1.22 vs 2.31 +/- 0.90  TAT (ng/ml): 60.5 +/- 31.3 vs 54.8 +/- 28.4  Jugular vein 104.8 +/- 110.5  F1+2 (mol/ml): 8.5 +/-3.7 vs 8.5 +/-4  Jugular vein 11.6 +/- 3.8  D-dimer (µg/ml): 1115 +/- 840.7 vs 1288 +/-1029  Protein S (%): 56.8 +/- 21.3 vs 56.4 +/- 16.3  Protein C (%): 86.6 +/- 20.8 vs 85.9 +/- 26  AT (%): 93.1 +/- 21.8 vs 89.7 +/- 18.4  FVII (%): 71.4 +/- 20 vs 74 +/- 24.3 |
| Hering et al. (2003) [19] | Peripheral arterial occlusive disease, n=11  Healthy, n=2 | Femoral artery and femoral vein from affected leg  Antecubital vein | F1+2, TAT | TAT, F1+2: 🡪 |
| Chen et al. (2003) [20] | Percutaneous transluminal mitral valvuloplasty, n=16  Mean age: 56.5  Males: 2 (12.5%) | Femoral artery and femoral vein (introducer sheaths)  A and V discard: 3 mL  Time: fasting, before anaesthesia | Flow cytometry: selectin expression | Selectin expression: 🡪 |
| Durila et al. (2010) [21] | Severe sepsis, n=44  Mean age: 62 y | Radial artery catheter  CVC  Both flushed with 4 IU/mL heparin, 3mL/h  A and V discard: 10 mL | INR, APTT, fibrinogen, platelet count, D-dimer, AT, TEG: R, K, α-angle, MA, Ly30 and LY60 | D-dimer: A  AT: A  INR, APTT, fibrinogen, platelet count, TEG: R, K, α-angle, MA, Ly30 and LY60: 🡪 |
| Kafian et al. (2011) [22] | Coronary angiography, n=28  Hereof n=23 PCI  Males: 25 (89%)  Aspirin and clopidogrel treatment | Femoral or radial artery (A sheath)  Antecubital vein (21G) | Platelet aggregation (agonists: ADP, ASPI) | Bland-Altman – mean bias (LLA; ULA):  ADP: 45 (-102; 192)  ASPI: 18 (-68; 105)  Low-responders clopidogrel and aspirin: Identical patients identified |
| Rondina et al. (2012) [23] | ICU-patients, n=116  Mean age: 51.4 y  Males: 41.4%  Average 2.3 sample/patient – A 66.9% | Sampling site was noted (A catheter, CVC, peripheral venepuncture)  Catheters flushed with saline  A + CVC discard: 3 mL  Time: 24 h after admission + every 48 h +/-24 h | Platelet flow cytometry (unstimulated and TRAP activated): PAC-1 binding, selectin expression, PMA | PMA: A  GPIIb/IIIa, selectin expression: 🡪  PMA correlates to total platelet count. |
| Oswald et al. (2013) [24] | Elective orthopaedic surgery, n=50  Median age: 64 y  No known coagulopathy  No treatment with AP or AC for 7 days | Arterial line (20G)  CVC (16G)  Both flushed with sodium chloride  A and V discard: 5 mL  Time: T0, intraop after 30ml/kg crystalloid/colloid fluids (T1), end of surgery (T2) (total 150 paired measurements) | ROTEM (INTEM, EXTEM og FIBTEM): CT, CFT, α-angle, A30, LI30  Platelet aggregation (agonists ASPI, ADP, TRAP) | ROTEM:  T0 INTEM, CT: A  T0 EXTEM CT: A  T1 INTEM A30: A  T1 EXTEM A30: A  T2 EXTEM A30: A  Platelet aggregation:  T0 ASPI: A  T1 TRAP: A  T2 ADP: A  Remaining parameters + time points: 🡪  T0 correlation coefficients  ROTEM: 0.519 (INTEM CT) – 0.977 (INTEM A30)  Platelet aggregation: 0.798-0.950 |
| Karlsson et al. (2013) [25] | Coronary artery bypass grafting, n=20  Mean age: 70 y  Males: 14 (70%)  No known coagulopathy | Radial artery  Antecubital vein  CVC  Time: preop after anaesthesia and tranexamic acid administration | Platelet aggregation (agonists ADP, TRAP) | Platelet aggregation: 🡪 |
| Shah et al. (2013) [26] | Coronary angiography, n=70  Median age: 65 y  Males 99% | Radial or femoral artery (sheath)  Antecubital vein (21 G)  A and V discard: 2 mL | Platelet count, mean platelet volume, immature platelet fraction, soluble selectin, flow cytometry: monocyte-platelet aggregates, leukocyte-platelet aggregates | All parameters: A |
| Tuovila et al. (2017) [27] | Different surgical procedures, n=51  Mean age: 65 y  Males: 25 (49%)  No AC or AP treatment | Radial artery (cannula) Antebrachial vein  Discard: 2.7 mL | TEG: R, MA | Mean of the difference (V-A) +/- sd, no p-values  R: -0.4391 +/- 2.0  MA: 0.3457 +/- 4.6 |
| Groves et al. (2019) [28] | Cardiac surgery with CPB, n=30 | Arterial catheter (20 G)  CVC  No heparin in catheters  A + V discard: 10 mL  Time: After anaesthesia, during CPB/after protamine | Viscoelastic testing: CT, CTH, CTR, CS | CT: A (14.2%)  CTH: A (11.9%)  Correlation CT r=0.85,  CTH r=0.72  CTR, CS: 🡪 |
| Törnudd et al. (2022) [29] | Cardiac surgery with CPB, n=10, hereof n=9 treated with acetylsalicylic acid  Mean age: 70 y  Males: 9 (90%)  No AC or ADP-inhibitor treatment for 5 days | Radial artery (cannula, 20 G)  Antebrachial or hand vein (16 or 17 G)  Time: Prior to anaesthesia | Platelet flow cytometry (total of 37 activators): PAC-1 binding, selectin, lysosomal associated membrane protein-1, annexin, 1,1ʹ,3,3,3ʹ,3ʹ-hexamethylindodicarbo-cyanine iodide, platelet-monocyte/lymphocytes/neutrophils aggregates  Platelet aggregation (agonists ASPI, ADP, TRAP, collagen) | Platelet flow cytometry:  Annexin: A  PAC-1 (some activators): A  Platelet-monocyte aggregates: A  Platelet-neutrophils aggregates: A  Remaining 27 parameters: 🡪  Platelet aggregation: 🡪 |

Abbreviations: a, activated; A, arterial; A30, amplitude after 30 min; AC, anticoagulant treatment; ACT, activated clotting time; ADP, adenosine diphosphate; AP, antiplatelet treatment; APTT, activated partial thromboplastin time; ASPI, aspirin (arachidonic acid); AT, antithrombin; AUC, area under curve; beta-TG, beta-thromboglobulin; CFT, clot formation time; CPB, cardiopulmonary bypass; CS, clot stiffness; CT, clotting time; CTH, heparinase clotting time; CTR, clot time ratio; CVC, central venous catheter; CVP, central port of pulmonary artery catheter; F1+2, prothrombin fragment 1 and 2; F, coagulation factor ; GMP-140, selectin expression; GP, glycoprotein; ICU, intensive care unit; INR, international normalized ratio; intraop, intraoperative(ly); LI30, lysis index after 30 min; LLA, lower limit of agreement; MA, maximum amplitude; PAD, Peripheral arterial occlusive disease; PMA, platelet-monocyte-aggregate; postop, postoperative(ly); preop, preoperative(ly); PT, prothrombin time; PTCA, percutaneous transluminal coronary angioplasty; PTT, partial thromboplastin time; R, reaction time; ROTEM, rotational thromboelastometry; SI, side port of introducer sheath; TAT, thrombin-antithrombin-complex; TCT, thrombin clotting time; TEG, thromboelastography; tPA, tissue plasminogen activator; tPA/PAI, tPA/plasminogen activator inhibitor 1-complex; TRAP, thrombin-receptor activating peptide-6; TT, thrombin time; ULA, upper limit of agreement; V, venous; vWF, von Willebrand factor; y, years.

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