Clinical trials of antithrombotics for thrombosis prevention in abdominal surgery

TrialResults-center www.trialresultscenter.org

1 extended prophylaxis

Trial	Treatments	Patients	Trials design and methods
extended prophylaxis vs standard prophylaxis			
Lausen , 1998 n=58/60 follow-up: 28 days	Tinzaparin 3500 UI/qd sc for 28 days started in preop versus Tinzaparin 3500 UI/qd + GES for 1 week started in preop	>18 years, open major abdominal surgery and non cardiac thoracic surgery of >1hour duration.	Parallel groups Open, blinded evaluation
ENOXACAN II (Bergqvist) , 2002 n=253/248 follow-up: 3 months	Enoxaparin 40 mg UI/qd sc for 25-31 days started in preop versus Enoxaparin 40 mg IU/qd sc for 6 to 10 days (GES optional) started in preop	>40 years, open major abdominal oncologic elective surgery of >45 minutes duration (includes gynecological surgery)	Parallel groups double blind
FAME (Rasmussen) , 2006 n=205/222 follow-up: 3 months	Dalteparin 5000 UI/qd SC for 28 days started in preop versus Dalteparin 5000 UI/qd SC for 7 days + GES started in preop	>18 years, major abdominal surgery of >1 hour duration	Parallel groups Open, blinded evaluation

References

Lausen, 1998:

Lausen I, Jensen R, Jorgensen LN, Rasmussen MS, Lyng KM, Andersen M, Raaschou HO, Wille-Jrgensen P Incidence and prevention of deep venous thrombosis occurring late after general surgery: randomised controlled study of prolonged thromboprophylaxis. Eur J Surg 1998;164:657-63 [9728784]

ENOXACAN II (Bergqvist), 2002:

Bergqvist D, Agnelli G, Cohen AT, Eldor A, Nilsson PE, Le Moigne-Amrani A, Dietrich-Neto F Duration of prophylaxis against venous thromboembolism with enoxaparin after surgery for cancer. N Engl J Med 2002;346:975-80 [11919306]

FAME (Rasmussen), 2006:

Rasmussen MS, Jorgensen LN, Wille-Jrgensen P, Nielsen JD, Horn A, Mohn AC, Smod L, Olsen B Prolonged prophylaxis with dalteparin to prevent late thromboembolic complications in patients undergoing major abdominal surgery: a multicenter randomized open-label study. J Thromb Haemost 2006;4:2384-90 [16881934]

2 low molecular weight heparin

Trial	Treatments	Patients	Trials design and methods
certoparin vs unfractionated heparin			

continued...

Trial	Treatments	Patients	Trials design and methods
Schmitz-Huebner , 1984 n=84/42 follow-up: 1 month	Certoparin (dose 1 and dose 2) b.i.d. versus UFH 10 000 units	Abdominal surgery	Blind
Sasahara , 1986 n=137/132 follow-up: 7 days	Certoparin 3000 + DHE versus UFH 10 000 units +DHE	Abdominal surgery	Blind
Voigt , 1986 n=103/97 follow-up: 10 days	Certoparin 3000 + DHE versus UFH 10 000 units	Abdominal surgery	Blind
Welzel , 1988 n=98/103 follow-up: 7 days	Certoparin 2500 + DHE versus UFH 10 000 units+DHE	Abdominal surgery	Open
Kakkar , 1989 n=88/91 follow-up:	Certoparin 3000 + DHE versus UFH 10 000 units+DHE	Abdominal surgery	Blind
Adolf , 1989 n=205/205 follow-up: 1 month	Certoparin 3000 versus UFH 15 000 units	Abdominal surgery	Blind
Baumgartner , 1989 n=99/102 follow-up: 10 days	Certoparin 3000 + DHE versus UFH 5 000 units+DHE	Abdominal surgery	Blind
Hoffmann and Largiade , 1990 n=464/452 follow-up:	Certoparin 3000 + DHE versus UFH 10 000 units	Abdominal surgery	NA
Koppenhagen , 1990 n=51/53	Certoparin 3000 anti Xa units versus UFH 15 000 units	Abdominal surgery	Blind
Schielke , 1991 n=47/51	Certoparin 3000 anti Xa units + DHE versus UFH 10 000 units + DHE	Abdominal surgery	Open
Koppenhagen , 1992 n=336/337	Certoparin 3000 anti Xa units versus UFH 15 000 units	Abdominal surgery	Blind
dalteparin vs unfractionated heparin			
Bergqvist , 1986 n=215/217 follow-up: 1 month	Dalteparin 5000 versus UFH 10 000 units	Abdominal surgery	Blind
Onarheim , 1986 n=25/27 follow-up: 1 month	Dalteparin 5000 versus UFH 10 000 units	Abdominal surgery	Blind
Koller , 1986 n=23/20 follow-up: 30 days	Dalteparin 7500 versus UFH 10 000 units	Abdominal surgery	Blind

continued...

Trial	Treatments	Patients	Trials design and methods
Koller , 1986 n=75/75 follow-up: 30 days	Dalteparin 2500 versus UFH 10 000 units	Abdominal surgery	Blind
Fricker , 1988 n=40/40 follow-up: 1-2 months	Dalteparin 5000 versus UFH 15 000 units	Abdominopelvic surgery	Open
Bergqvist , 1988 n=505/497 follow-up: 1 month	Dalteparin 5000 versus UFH 10 000 units	Abdominal surgery	Blind
Caen , 1988 n=195/190 follow-up: 1 month	Dalteparin 2500 versus UFH 10 000 units	Abdominal surgery	Blind
Hartl , 1990 n=126/124 follow-up: >7 days	Dalteparin 2500 versus UFH 10 000 units	Abdominal surgery	Blind
Kakkar , 1993 n=1894/1915	Dalteparin 2500 anti Xa units versus UFH 10 000 units	Abdominal surgery	Blind
enoxaparin vs unfractionated heparin			
McLeod (Canadian) , 1995 n=674/675	Enoxaparin 4000 anti Xa units versus UFH 15 000 units	Colorectal surgery	Blind
Gonzalez , 1996 n=84/82	Bemiparin 2500 anti Xa units versus UFH 10 000 units	Abdominal surgery	Blind
nadroparin vs unfractionated heparin			
EFS , 1988 n=968/941 follow-up: 1 month	Nadroparin 2850 versus UFH 15 000 units	Abdominal surgery	Open
parnaparin vs unfractionated heparin			
Catania , 1988 n=88/85 follow-up:	Parnaparin 3200 versus UFH 15 000 units	Abdominal surgery	Open
Salcuni , 1988 n=73/68 follow-up:	Parnaparin 3200 versus UFH 15 000 units	Abdominal surgery	Open
Verardi , 1989 n=44/44 follow-up:	Parnaparin 6400 versus UFH 10 000 units	Abdominal/urological surgery	NA
Garcea , 1992 n=45/45	Parnaparin 3200 anti Xa units versus UFH 15 000 units	Abdominal surgery	Open

References

Schmitz-Huebner, 1984:

Schmitz-Huebner U, Bnte H, Freise G, Reers B, Rschemeyer C, Scherer R, Schulte H, van de Loo J Clinical efficacy of low molecular weight heparin in postoperative thrombosis prophylaxis. Klin Wochenschr 1984;62:349-53 [6374278]

Sasahara, 1986:

Sasahara AA, Koppenhagen K, Hring R, Welzel D, Wolf H Low molecular weight heparin plus dihydroergotamine for prophylaxis of postoperative deep vein thrombosis. Br J Surg 1986;73:697-700 [3530367]

Voigt, 1986:

Voigt J, Hamelmann H, Hedderich J, Seifert J, Buchhammer T, Khler A [Effectiveness and side effects of low-molecular weight heparin-dihydroergotamine in preventing thromboembolism in abdominal surgery] Zentralbl Chir 1986;111:1269-305 [3544605]

Welzel, 1988:

Welzel D, Wolf H, Koppenhagen K Antithrombotic defense during the postoperative period. Clinical documentation of low molecular weight heparin. Arzneimittelforschung 1988;38:120-3 [2835055]

Kakkar, 1989:

Kakkar VV, Stringer MD, Hedges AR, Parker CJ, Welzel D, Ward VP, Sanderson RM, Cooper D, Kakkar S Fixed combinations of low-molecular weight or unfractionated heparin plus dihydroergotamine in the prevention of postoperative deep vein thrombosis. Am J Surg 1989;157:413-8 [2539025]

Adolf, 1989:

Adolf J, Knee H, Roder JD, van de Flierdt E, Siewert JR [Thromboembolism prophylaxis with low molecular weight heparin in abdominal surgery] Dtsch Med Wochenschr 1989;114:48-53 [2535983]

Baumgartner, 1989:

Baumgartner A, Jacot N, Moser G, Krhenbhl B Prevention of postoperative deep vein thrombosis by one daily injection of low molecular weight heparin and dihydroergotamine. Vasa 1989;18:152-6 [2545054]

Hoffmann and Largiade, 1990:

Koppenhagen, 1990:

Schielke, 1991:

Koppenhagen, 1992:

Bergqvist, 1986:

Bergqvist D, Burmark US, Frisell J, Hallbk T, Lindblad B, Risberg B, Trngren S, Wallin G Low molecular weight heparin once daily compared with conventional low-dose heparin twice daily. A prospective double-blind multicentre trial on prevention of postoperative thrombosis. Br J Surg 1986;73:204-8 [3512031]

Onarheim, 1986:

Onarheim H, Lund T, Heimdal A, Arnesj B A low molecular weight heparin (KABI 2165) for prophylaxis of postoperative deep venous thrombosis. Acta Chir Scand 1986;152:593-6 [3544625]

Koller, 1986:

Koller M, Schoch U, Buchmann P, Largiadr F, von Felten A, Frick PG Low molecular weight heparin (KABI 2165) as thromboprophylaxis in elective visceral surgery. A randomized, double-blind study versus unfractionated heparin. Thromb Haemost 1986;56:243-6 [3551180]

Koller, 1986:

Koller M, Schoch U, Buchmann P, Largiadr F, von Felten A, Frick PG Low molecular weight heparin (KABI 2165) as thromboprophylaxis in elective visceral surgery. A randomized, double-blind study versus unfractionated heparin. Thromb Haemost 1986;56:243-6 [3551180]

Fricker, 1988:

Fricker JP, Vergnes Y, Schach R, Heitz A, Eber M, Grunebaum L, Wiesel ML, Kher A, Barbier P, Cazenave JP Low dose heparin versus low molecular weight heparin (Kabi 2165, Fragmin) in the prophylaxis of thromboembolic complications of abdominal oncological surgery. Eur J Clin Invest 1988;18:561-7 [2852111]

Bergqvist, 1988:

Bergqvist D, Mtzsch T, Burmark US, Frisell J, Guilbaud O, Hallbk T, Horn A, Lindhagen A, Ljungnr H, Ljungstrm KG Low molecular weight heparin given the evening before surgery compared with conventional low-dose heparin in prevention of thrombosis. Br J Surg 1988;75:888-91 [2846113]

Caen, 1988:

Caen JP A randomized double-blind study between a low molecular weight heparin Kabi 2165 and standard heparin in the prevention of deep vein thrombosis in general surgery. A French multicenter trial. Thromb Haemost 1988;59:216-20 [2838923]

Hartl, 1990:

Hartl P, Brcke P, Dienstl E, Vinazzer H Prophylaxis of thromboembolism in general surgery: comparison between standard heparin and Fragmin. Thromb Res 1990;57:577-84 [2158151]

Kakkar, 1993:

McLeod (Canadian), 1995:

Gonzalez, 1996:

EFS, 1988:

Comparison of a low molecular weight heparin and unfractionated heparin for the prevention of deep vein thrombosis in patients undergoing abdominal surgery. The European Fraxiparin Study (EFS) Group. Br J Surg 1988;75:1058-63 [2905187]

Catania, 1988:

Catania G, Salanitri G Prevention of postoperative deep vein thrombosis by two different heparin types. Int J Clin Pharmacol Ther Toxicol 1988;26:304-9 [2842266]

Salcuni, 1988:

Verardi, 1989:

Verardi S, Cortese F, Baroni B, Boffo V, Casciani CU [Role of low molecular weight heparin in the prevention of postoperative deep venous thrombosis. Our experience in 88 cases] G Chir 1989;10:674-8 [2562010]

Garcea, 1992:

3 synthetic oligosaccharide

Trial	Treatments	Patients	Trials design and methods
fondaparinux vs control			
NCT00333021 *ongoing* [NCT00333021] n=NA follow-up:	-	Abdominal Surgery	Parallel groups open japan
fondaparinux vs placebo (on top intermittent pneumatic comp.)			
APOLLO (Turpie) , 2007 n=650/659 follow-up: 10 days	fondaparinux 2.5 mg s.c. for 5-9 days, starting 6-8 h postoperatively + intermittent pneumatic compression versus placebo s.c. for 5-9 days, starting 6-8 h postoperatively + intermittent pneumatic compression	Patients aged at least 40 years undergoing abdominal surgery	Parallel groups double blind US
fondaparinux vs enoxaparin			

continued...

Trial	Treatments	Patients	Trials design and methods
PEGASUS , 2005 n=1465/1462 follow-up: 10 days (30 days)	once-daily subcutaneous injections of fondaparinux 25 mg started 6 h after surgery for 59 days versus once-daily subcutaneous injections of dalteparin 5000 units for 59 days (2500 units each, given 2 h before surgery and 12 h after the preoperative administration)	patients undergoing major abdominal surgery	Parallel groups double blind 22 countries

References

NCT00333021, :

APOLLO (Turpie), 2007:

Turpie AG, Bauer KA, Caprini JA, Comp PC, Gent M, Muntz JE Fondaparinux combined with intermittent pneumatic compression vs. intermittent pneumatic compression alone for prevention of venous thromboembolism after abdominal surgery: a randomized, double-blind comparison. J Thromb Haemost 2007;5:1854-61 [17723125]

PEGASUS, 2005:

Agnelli G, Bergqvist D, Cohen AT, Gallus AS, Gent M Randomized clinical trial of postoperative fondaparinux versus perioperative dalteparin for prevention of venous thromboembolism in high-risk abdominal surgery. Br J Surg 2005;92:1212-20 [16175516]

4 About TrialResults-center.org

TrialResults-center is an innovative knowledge database that collects the results of RCTs and provides dynamic interactive systematic reviews and meta-analysis in the field of all major heart and vessels diseases.

The TrialResults-center database provides a unique view of the treatment efficacy based on all data provided directly from clinical trial results, offering a valuable alternative to personal bibliographic search, published meta-analysis, etc. Furthermore, it would allow comparing easily the various concurrent therapeutic for the same clinical condition.

Rigorous meta-analysis method is used to populate TrialResults-center: widespread search of published and non published trials, study selection using pre-specified criteria, data extraction using standard form.

TrialResults-center is continually updated on a weekly basis. We continually search all new results (whatever their publication channel) and these news results are immediately added to the database with a maximum of 1 week.

TrialResults-center is non-profit and self-funded.