

Problems with Self-injecting Low-Molecular-Weight Heparins in Primary Care

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Background and Objective

Outpatient subcutaneous (s.c.) therapies are becoming more and more common, such as treatments for multiple sclerosis, arthritis, anaemia, cancer, hepatitis or female infertility. Low-molecular-weight heparins (LMWH) are frequently used for the prevention and treatment of venous thromboembolism [1-3]. A literature search failed to find studies on application problems concerning self-injection of LMWH in a heterogeneous outpatient population under daily life conditions receiving standard care.

Thus, we designed a prospective cross-sectional study to record drug use problems, compliance, problems arising from the injection site (abdomen vs. thigh) and residual drug volumes in the used pre-filled syringes.

Methods

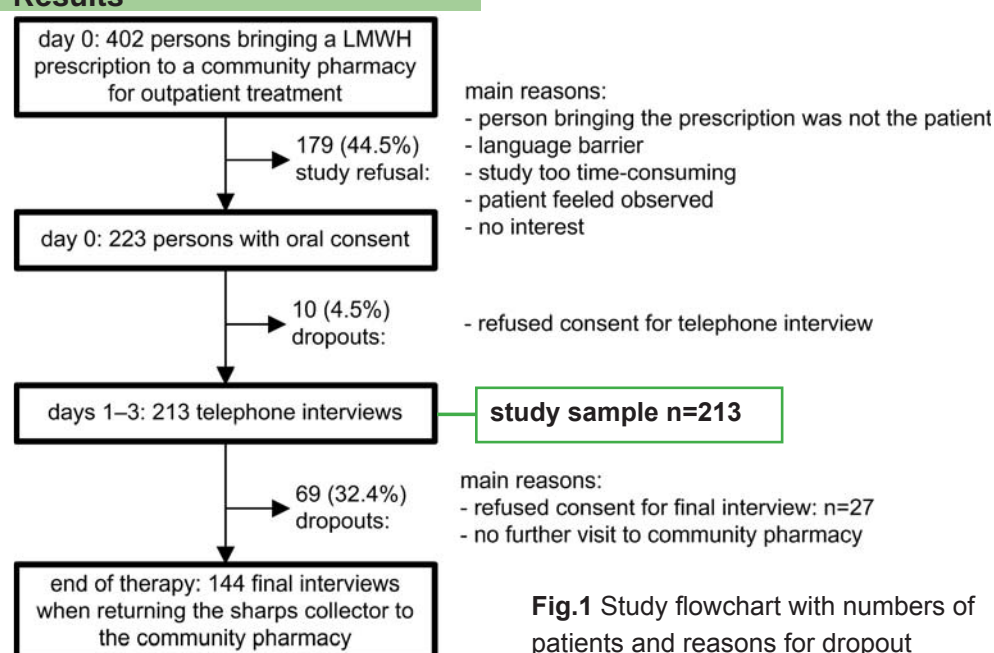
• Sequential **recruitment** in community pharmacies by 95 trained master's students during their internship between January and May 2008

Inclusion criteria:

- outpatients aged ≥18 years
- all brands of LMWH (pre-filled syringes)
- prophylactic or therapeutic use
- new or long-term prescription
- first or previous outpatient s.c. treatment
- all therapy durations
- self-injection or application by another person
- no comprehension difficulties due to language

• **Data collection** by students: Structured questionnaire-based interviews, both at the beginning and at the end of the individual LMWH treatment

Results



Reasons for LMWH treatment (multiple answers possible)	%
orthopedic surgery / injury	61.1
thrombosis / embolism	16.4
bridging / perioperative management	7.5
atrial fibrillation, myocardial infarction	3.8
cancer	3.3
pregnancy, hormone therapy	2.8
abdominal surgery	2.8
long-distance travel	1.9
other	5.6

Medication characteristics

number of syringes in sharps collectors: median (IQR)	10.5 (8-26)
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Fragmin®: 46.5% **Fraxiparine®:** 29.6% **Clexane®:** 15.5% **Sandoparin®:** 4.2%
Fraxiforte®: 4.2%

Patient characteristics

age (years): median (IQR)	54 (39-70)
males	50.7%
previous outpatient s.c. injection therapies	41.8%

Self-management:

- injection site thigh: 68.5%
- injections administered by another person: 15.5%
- estimations at the end of treatment:
 - high confidence: 81.7%
 - injection required some effort: 38.9%
- comfort and effort required didn't change significantly over time
- patients with experience gained from previous outpatient s.c. injection therapies had less discomfort (p = 0.011) and the injections required less effort (p = 0.022)

Patients with ≥ 1 relevant* drug use problem: 85.0%

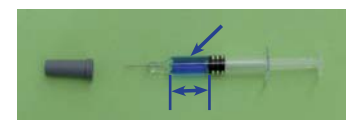
*patients insufficiently informed about injection site or technique; injections administered by another person; recapping (73.7%); difficulties with removal of the needle shield; discrepancies with prescribed therapy duration (not specified on prescription: 27.7%), daily injections (not specified on prescription: 12.7%) and injection time (not specified on prescription: 73.7%)

Self-reported non-compliance: 17.1%

- main reasons: forgotten: 44.0%
early discontinuation: 24.0%

Residual drug volumes:

- 3'218 syringes of 180 patients analysed
- overall mean residual drug volume ≥10.0%: 3.9% of patients
- no residual drug in any syringe: 46.1% of patients
- if residual drug was present, a median of 11.2% (IQR: 8.6-17.6%) of the total drug volume had not been injected
- patients injecting into the thigh showed a higher risk of leaving residual medication (OR 2.16 (95% CI 1.04-4.51))
- no other risk factors for residual drug volumes were identified



Handling difficulties with the injection device:

- difficulties with **removal of needle shield:** 13.1% of patients
- needle shield of Fragmin® was rated as significantly easier to remove than the ones of Clexane® (p = 0.021) and Fraxiparine® (p = 0.003)



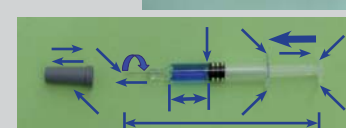
Post-injection needle guards:

- needle guards of all Fraxiparine® or Fraxiforte® syringes activated and positioned correctly: 32.8% of patients



Additional handling difficulties:

- 15.5% of patients



Discussion

- Most patients had drug use problems, whereas no clear factors were associated with non-compliance, the injection site (beside residual drug) and discomfort or effort required (beside prior injection use)
- Important differences concerning difficulties with removal of the needle shield between different LMWH brands were observed, confirming the results of a previous investigation [4]
- From a patient's point of view, injections required some effort. Therefore, one could imagine that injection-free therapies for patients on chronic antithrombotic therapy would be appreciated

References

- [1] Geerts WH et al. (2008) Chest 133 (Suppl):381S-453S [2] Bates SM et al. (2008) Chest 133 (Suppl):844S-886S [3] Ansell J et al. (2008) Chest 133 (Suppl):160S-198S [4] Mengiardi S et al. (2009) Eur J Clin Pharmacol 65:1061-1062

Conflict of interest

This study was supported by Pfizer AG through an unrestricted Investigator-Initiated Research Grant (IIRG)

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ESCP 2010
39th European Symposium on Clinical Pharmacy
21-23 October 2010, Lyon, France