Which enoxaparin preventive dose for obese patients in orthopedic surgery ?

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What was done ?

An analysis of enoxaparin prescriptions at a preventive dose for thromboprophylaxis for obese patients was conducted in our orthopedic surgery center.

How was it done ?

By an observational monocentric retrospective study **:** we collected the preventive prescriptions of enoxaparin during the hospitalization duration from 01/01/2020 to 02/28/2020. We compared enoxaparin's dose with different criteria: sex, age, weight, body mass index (BMI), glomerular filtration flow, surgical and medical history, long term treatment, surgical indication and prescribers.

Why was it done ?

Canadian's recommandations (1)	
For patients with weight between 40-100 kg without considering the BMI For hip or knee arthroplasty : 3000 IU twice a day or 4000 IU/d For hip fracture surgery : pre-op 3000 IU/d and post-op 4000 IU/d For major orthopedic trauma : 3000 IU twice a day	
European's guidelines except for bariatric surgery (2)	French's guidlines except for bariatric surgery (3)
BMI ≥ 40 kg/m² : 3000 or 4000 IU twice a day BM < 40 kg/m² : 4000 IU/d	BMI > 40 kg/m² : 3000 or 4000 IU twice a day

In the summary of product characteristics, enoxaparin's exposition increases with small weights and only monitoring recommandations exist to prevent bleeding risk. At the opposite, thromboembolic risk is increased for patients with BMI higher than 40 kg/m², and there is no more official guidelines. Into obese patients, prescribers seem to use different doses of enoxaparin for thromboembolic risk prevention, in orthopedic surgery.

<u>What to do for patients with a BMI higher than 30 kg/m² in orthopedic surgery ?</u>

What was achieved ?

We included 517 patients.

Only the criteria BMI and weights independantly influence enoxaparin's doses. Other criterias have no influence. In our study, no patient had a glomerular renal fonction inferior at 15 mL/min. No thrombosis or significant bleeding occured.

<u>Patients distribution based on enoxaparin's doses</u>

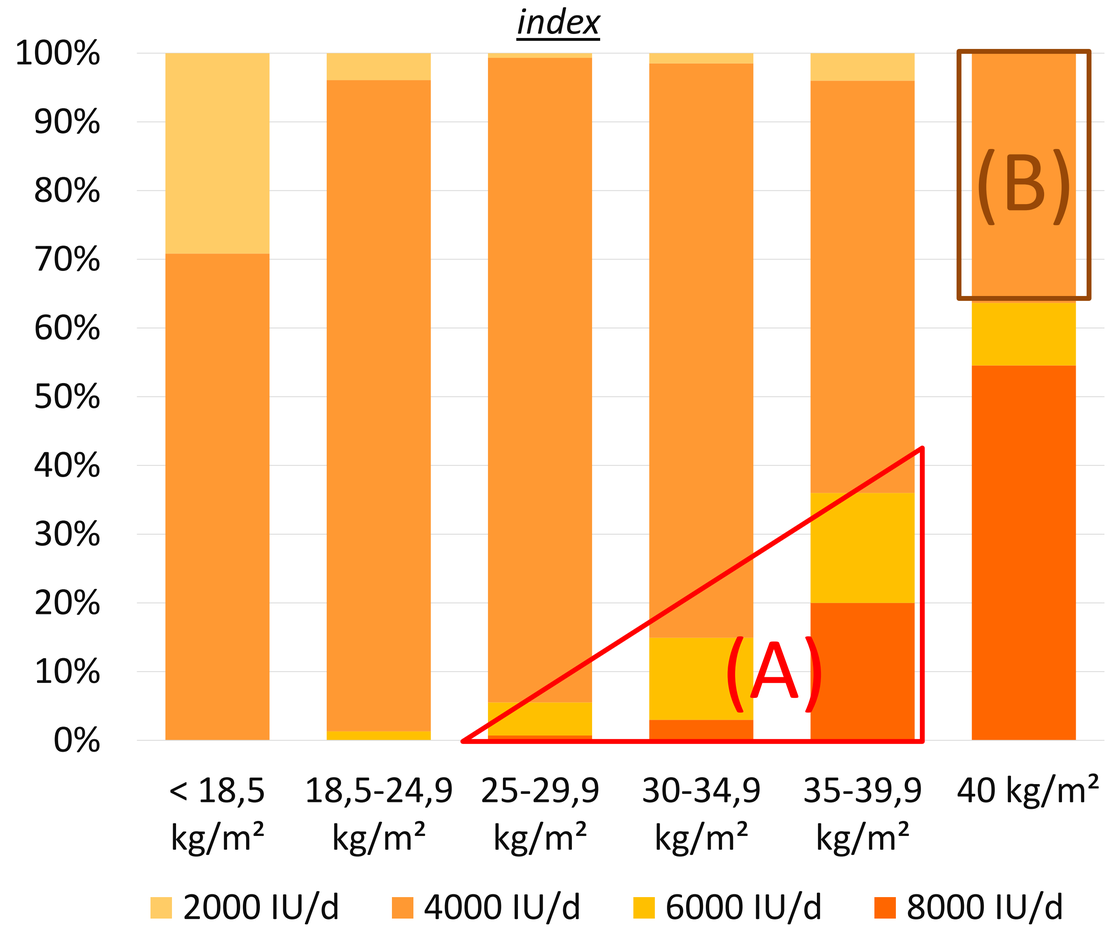
Enoxaparin's dosage	Number of patients	Median BMI (kg/m²)	Median weight (kg)
2000 IU/d	20 (4%)	20,5	50
4000 IU/d	462 (89%)	24,7	71
6000 IU/d	21 (4%)	31,3	90
8000 IU/d	14 (3%)	37,5	110

<u>BMI</u>

The dosage increases from BMI ≥ 25 kg/m².
In our study, 103 (20%) patients are obeses (BMI ≥ 30), and 11 (2%) have a BMI ≥ 40 kg/m².
Among patients with BMI < 40kg/m² (n=506), 29 (6%) had an enoxaparin dosage higher than 4000 IU/d (can be overuse). **(A)**
Among patients with BMI ≥ 40 kg/m², 4 (34%) had a dosage of 4000 IU/d (can be underuse). **(B)**

- For BMI < 30 kg/m², prescriptions are homogeneous with only few doses decreased (renal failure ou low thrombotic risk).
- For BMI between 30 and 40 kg/m², there is a disparity in dosages between prescribers and by precribers.
- For BMI ≥ 40 kg/m², each prescriber seems to have his own « protocole ».

<u>Dosages of Enoxaparin prescribed based on body mass index</u>



<u>WEIGHT</u>

Most of the time, enoxaparin's doses increase with high weights (≥ 90 kg). One prescriber systematically increases the enoxaparin's dose for weights higher than 80kg independently of the BMI value. Increasing the dose is a trend for high weight but with no clear consensus.

What is next ?

This study highlights the heterogenicity of preventive dose of enoxaparin for obese patients in our orthopedic surgery context. Based on US recommandations, we should propose to anesthesiologists enoxaparin doses adaptation for patients with weight ≥ 100 kg and/or BMI ≥ 40 kg/m². According to our study and litterature, it doesn't seem obvious to adapt enoxaparin dose for weight < 100kg and /or BMI < 40 kg/m². Work in tandem with anesthesiologists is underway to harmonize practices, in our center.

<u>Sources :</u>
1. "Thromboprophylaxis : orthopedic surgery"; Thrombosis Canada;2018Feb27
2. Alblaladej and al. "Europan Guidelines on perioperative venous thromboembolism prophylaxis" ; Eur J Anaesthesiol 2018;35:77-83
3. Roullet S. "Thrombophylaxie périopératoire : nouvelles recommandations" ; Journées d'Anesthésie Réanimation Chirurgicales d'Aquitaine; 2018