



PREHABILITATION FOR ELECTIVE MAJOR ABDOMINAL SURGERY, A RANDOMIZED CONTROLLED TRIAL – PISO TRIAL, PILOT STUDY

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INTRODUCTION

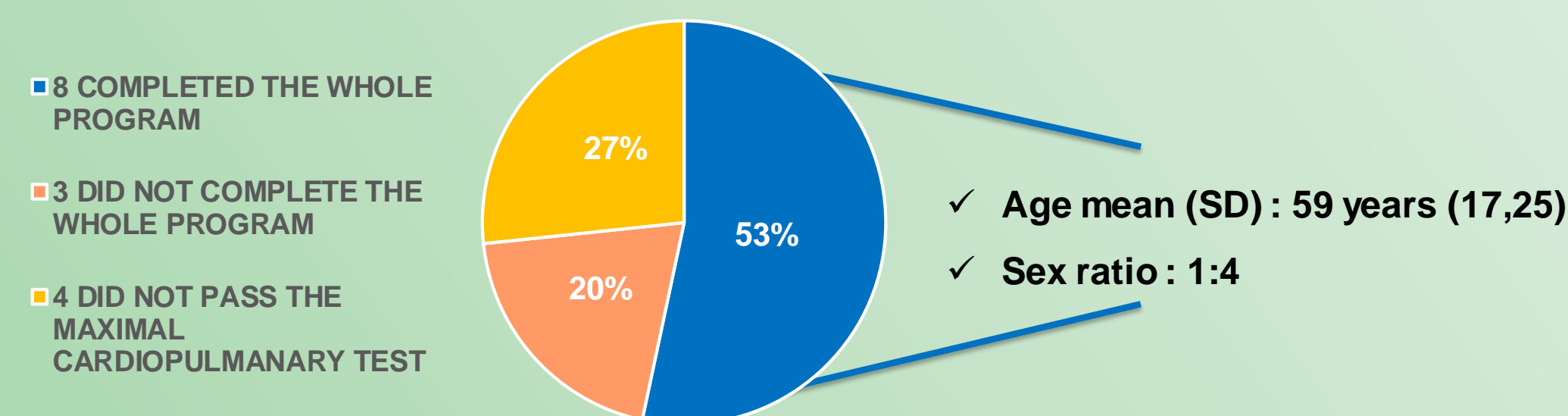
Depending on the illness and the level of pain and anxiety, frequently impairing the level of physical activity, most patients undergoing major abdominal surgery arrive in a **deconditioned state** on the date of their intervention. Preoperative management has evolved considerably over the last two decades.

PURPOSE

This pilot study assesses the **impact of personalized prehabilitation** on physical capacity and quality of life in high-risk patients undergoing elective major abdominal surgery.

PARTICIPANTS

15 eligible candidates accepted to participate in the study.



Inclusion criterias

- Elective major abdominal surgery

Exclusion criterias

- Patient < 18 years, consent not obtained
- Coronary artery disease (≥ stage III according to CCS)
- Heart disease (≥ stage III according to NYHA)
- Uncontrolled cardiac arrhythmias
- COPD (GOLD stage ≥ III)
- Physical inability to ride a bike
- Orthopedic surgery in the last 6 weeks

METHOD

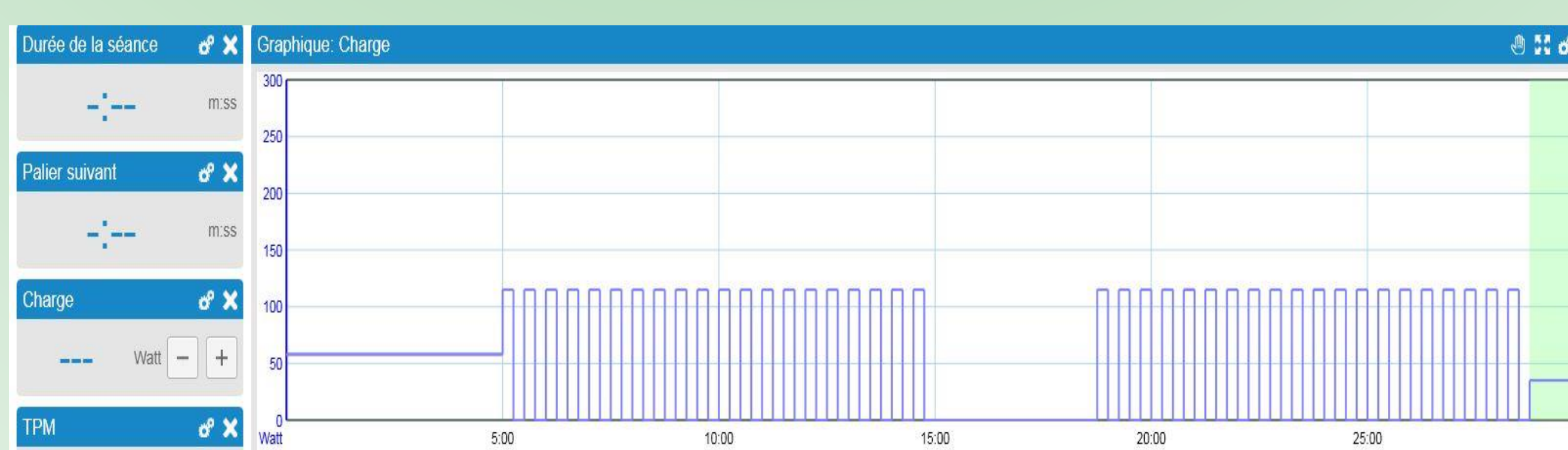
Assessment

| PRE-SURGERY | | | MAJOR ABDOMINAL SURGERY | 8 TO 10 WEEKS POST-SURGERY | |
|--|---------------------------|--|-------------------------|--|--|
| Quality of life questionnaires | HIIT ON A CYCLE-ERGOMETER | Quality of life questionnaires | | Quality of life questionnaires | |
| Maximal cardiopulmonary exercise testing (VO ₂ max) | 9 SESSIONS | Maximal cardiopulmonary exercise testing (VO ₂ max) | | Fonctionnal tests : TUG, 6MWT, 200mFWT | |
| Fonctionnal tests : TUG, 6MWT, 200mFWT | 3 SESSIONS PER WEEK | Fonctionnal tests : TUG, 6MWT, 200mFWT | | | |

TUG : Timed Up-and-Go test / 6MWT : 6-Minute Walk Test / 200mFWT : 200-Metre Fast Walk Test / HIIT : High Intensity Interval Training

Training Program

During the preoperative waiting time (mean 30 days), patients took part in a mean of 8.25 HIIT sessions. After a 5-minute warm-up period at 50% of peak work rate (peak WR) on a cycle-ergometer, the patients completed two 10-minute series of 15-second sprint intervals (at 100% peak WR) interspersed with 15-second active pauses and a 4-minute active rest between the two series. The patients then cooled down with a 5-minute active recovery period at 30% of peak WR.



REFERENCES

- Guiraud T, Nigam A, Gremeaux V, Meyer P, Juneau M, Bosquet L. High-Intensity interval training in cardiac rehabilitation. Sports Med. 2012 Jul 1; 42(7) : 587-605.
 Lee L, Schwartzman K, Carli F, Zavorsky GS, Li C, Charlebois P, et al. The association of the distance walked in 6 min with pre-operative peak oxygen consumption and complications 1 month after colorectal resection. Anaesthesia. 2013 Aug;68(8) : 811-6.

RESULTS

| | BEFORE SURGERY : POST vs PRE HIIT | | | | POST SURGERY : 8-10 WEEKS AFTER vs PRE HIIT | | | |
|--------------------------------|-----------------------------------|---------------|-----------------|---|---|---------------|----------------|---|
| | % | MEAN (SD) | CI 95% | | % | MEAN (SD) | CI 95% | |
| VO ₂ max (ml/kg/mn) | +8.78 | 1.55 (2.84) | -0.82 to 3.92 | ↑ | | | | |
| TUG (sec) | -5.00% | -0.32 (0.54) | -0.74 to 0.08 | ↑ | -7.00% | -0.44 (0.57) | -0.88 to 0 | ↑ |
| 6MWT (m) | -0.26% | -1.37 (34.30) | -30.05 to 27.30 | = | +4.81% | 25.62 (40.18) | -7.96 to 59.51 | ↑ |
| 200MFT (sec) | -1.91% | -2.37 (6.84) | -8.09 to 3.35 | ↑ | -2.52% | -3.12 (4.55) | -6.93 to 0.68 | ↑ |

Concerning quality of life, EMMBEP's results before surgery and after eight to ten weeks remained stable (44 to 47 out of 64). Throughout the EORTC QLQ-C30 version 3.0, **global health status and functional scale increased** respectively from 53.13% to 60.42% and from 76.39% to 83.89%, although **symptom scales rose** from 15.06% to 18.27%.

DISCUSSION & CONCLUSION

Short-term preoperative rehabilitation with HIIT shows encouraging results : **improvements of physical capacity and quality of life maintenance**.

This prehabilitation program requires a **huge amount of motivation from the patients**, regarding the duration, the frequency and the physical effort. The **physical therapist's encouragements**, to motivate the patient to successfully complete the program, should not be underestimated.

This pilot study was realized with a small sample, and would probably give more compelling results with a higher number of subjects.

It would also be interesting to compare the effects of two different prehabilitation modalities.

RECOMMANDATION

A prehabilitation program, before major surgery, should be integrated in the management of abdominal surgery patient.