ADAPTED PHYSICAL ACTIVITY (APA) INTERVENTION AMONG ADULTS WITH BLOOD CANCER UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT) : A FEASIBILITY STUDY.

Lemercier L¹, Bernard P², Cartron G¹, Ninot G²

¹ Department of Clinical Hematology, University Hospital St Eloi, Montpellier, France
² Laboratory Epsylon EA4556, University of Montpellier 1, Montpellier, France
Key numbers:

- 35K new cases of blood cancer in France in 2012 (Monnereau, 2013).

- 1st indication of HSCT (Wiskemann, 2013).

- 40K HSCT across the world every year with a success of 50% (Rizzo, 2006) (Aspert-Houballah et al. 2011).

- $M = 48$ years, max = 70 years

Evolution in the number of HSCT by type of donor

(Agence Nationale de la Biomédecine, 2010)
Side effects:
- Fatigue, nausea, anxiety & depression, pain, Graft Versus Host Disease (GVHD) etc.
- Physical functioning, weight, focus etc.

(Tierney et al. 2007)
Exercise for the management of cancer-related fatigue

- **Description**: 56 RCT (n = 4068), aerobic and resistance exercise, majority of breast cancer, exercise compare to usual care group.  
  
  (Cramp & Daniel, 2012)
Exercise for the management of cancer-related fatigue

- **Description**: 56 RCT (n = 4068), aerobic and resistance exercise, majority of breast cancer, exercise compare to usual care group.
  
  (Cramp & Daniel, 2012)

- **Main results**:

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise versus no exercise control: post-test means</td>
<td>18</td>
<td>1456</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.23 [-0.33, -0.12]</td>
</tr>
</tbody>
</table>
**Exercise for the management of cancer-related fatigue**

- **Description**: 56 RCT (n = 4068), aerobic and resistance exercise, majority of breast cancer, exercise compare to usual care group. (Cramp & Daniel, 2012)

- **Main results**:

<table>
<thead>
<tr>
<th>Exercise Type</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fatigue: aerobic training</strong></td>
<td>22</td>
<td>1533</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.22 [0.34, -0.10]</td>
</tr>
<tr>
<td><strong>Fatigue: resistance training</strong></td>
<td>5</td>
<td>401</td>
<td>Std. Mean Difference (IV, Random, 95% CI)</td>
<td>-0.18 [0.39, 0.02]</td>
</tr>
</tbody>
</table>
Exercise for the management of cancer-related fatigue

- **Description**: 56 RCT (n = 4068), aerobic and resistance exercise, majority of breast cancer, exercise compare to usual care group. (Cramp & Daniel, 2012)

- **Main results**:

- **Conclusion**:
  - Aerobic exercises have some benefits on cancer-related fatigue (solid tumors)
  - Only 4 RCT (n = 220) about hematological malignancies

Dance & cancer patients: Only 2 studies.

(Dibbell-Hope, 1989 ; Sandel et al., 2005)
Participants:
- Adults
- Hematopoietic malignancies
- HSCT
Participants:
- Adults
- Hematopoietic malignancies
- HSCT

Adapted Physical Activity (APA) program:
- Starting 10 days after HSCT, 3 weeks, 3 sessions/week during 45’.
- APA: Dance.
- 65% to 85% HRmax.
- Cooperative pedagogy (Baudrit, 2005).
- Security: respect of rules in sterile room, HR tracked 5 times/session.
- Post-hospital guide practice.
CATEGORIE 1:

1) Chorégraphie Latino: Suivre l'exemple ci-dessous. Ne pas hésiter à bouger du bassin, être sensuelle!

Realiser cet enchainement a gauche ET a droite.

Realiser cet enchainement vers l'avant PUIS vers l'arriere.

Realiser cet enchainement a gauche ET a droite.
Measurement:

- HSCT
- D0
- D10
- D30/40
- Control
- ChemoT
- Aplasia
- GVHD
- APA
- Release hospitalization
- Feasibility + HR
Measurement:

- HSCT
- D0
- D10
- D30/40

Control

APA

ChemoT

Aplasia

GVHD

Release hospitalization

T0
- MFI-20
- HADS

T1
- MFI-20
- HADS
- Satisfaction

D = Day(s)

T0 = Time 0

T1 = Time 1
Statistical analysis:

- Inter-group difference at T0:
  - Student T test
  - Fisher test

- Intra-group difference at T0 and T1:
  - Student T

- Inter-group difference at T1:
  - ANCOVA

- R® software was used
Acceptability:
- Recruitment period: 5 months
- 15 eligible patients, 12 finally included
  \[80\%\] acceptability rate

Adherence:
- 88.8\% (77.7\% to 100\%)
- 48 sessions / 54

Satisfaction:
- \(M = 94/100\) (± 5.6)
- The average score of each item was superior to 8.5/10
Heart Rate target zone (HR):
- HR target zone was reached in 54.7% of cases.
- Decrease in perceived fatigue at T1 for the APA-G, statistical trend (p=0.09).
- No statistical intra-group difference for the CG (p = 0.59).
- No statistical intergroup difference at T1 (p = 0.7).
Anxiety and depression:

- No statistical difference for each group at T1:
  - APA-G: Anxiety $p = 0.59$; Depression $p = 0.75$
  - CG: Anxiety $p = 0.60$; Depression $p = 0.07$

- No statistical intergroup difference at T1: (Anxiety $p = 0.8$; depression $p = 0.7$)
Acceptability:
- HSCT = 73% / 90% (Tonosaki, 2012; Hacker et al., 2011)
- Dance intervention & chronic diseases = 65/70%. (Blazques et al., 2010; Jeong & Hong, 2005)
- Protected environment = security, care, high risk of mortality!
  Advice from doctors?
  More visits before?

Adherence:
- Meta-analysis exercise & HSCT = 80.1% (Persoon et al., 2013)
- Pilot study dance & cancer = 86.5% (Ho, 2005)

→ Past PA behavior = 1st predictor of adherence (Courneya et al., 2002)
→ Intention, self-efficacy and instrumental attitude = importants predictors (Speed-Andrews et al., 2012)
Satisfaction:
- Clinical research dance & breast cancer = pleasure during sessions (Dibbell-Hope, 2000)
- Pleasure becomes the 3rd pillar of PA prescription (Ekkekakis et al., 2013)
- Dance can improve more pleasure than exercise?

Heart Rate target zone (HR):
- Beginning of the exercise programme: practice to 55/65% of HRmax.
- Increase practice time during 12 weeks.
- Investigator was multiplying practice time by intensity and knew if the patient had reached his weekly goals.

(Pinto et al., 2009)
Fatigue:
- Small sample size and short program duration (Liu et al., 2009; Wiskemann, 2008)

Anxiety and depression (A&D):
- The only study observe no effect (Schmitz et al., 2010)
- More anxiety before and up to 10 days after HSCT (Leight et al., 1995; Mosher et al., 2009)

  HADS T0: 10 days after HSCT = No disorder detected at baseline

- Decreased of A&D in CG
  Stopping the program + decreasing of attention from investigator = aggravation of A&D (Wiskemann et al., 2011)
Limits:
- Small sample size & duration
- Uncontrolled design
  → Need to realize a RCT
- No indication of fitness

Conclusion:
- 1st study about HSCT and dance
- Acceptability, satisfaction & adherence seem to be good
- Achieves a target intensity
- Can have effects with an longer program
This study will be submitted to the French review "Oncologie"
I am currently seeking funding to implement a RCT.

Thank you to the French Society of APA Professionals for their financial support.

lemercier-laura@hotmail.fr
06.85.85.10.22