Physical Activity for Dialysis Patients, What is the Benefit?

Dr Myriam ROUCHON ISNARD
L’évolution de l’espèce humaine

est préoccupante
Dialysis:

Hemodialysis
- 3 times a week
- 4 hours
- Center / Home

= Times eater

Peritoneal Dialysis
- Every day
- Home
And ....
What Is the Leading Cause of Death in Dialysis Patients?

Impaired Health
Inactivity
- Altered body composition
  - More fat, less muscle
  - Increased risk of CVD
  - and other health problems
Deconditioning
Disability
- Multimorbidities

Optimal physical functioning
Increased physical activity
Exercise counseling

Himmelfarb et al. 2000
Bay et al. 2009

Johansen KL. JASN 2007;18:1845-54
Physical Activity during Dialysis (1)

- Mortality
  - Sedentary is associated with an increased risk of mortality (11% vs 5%) (O’Hare AM et al. 2003)

- Myocardial Function

- Vessels
  - Reduction of systolic and diastolic pressure during and after dialysis (Anderson et al. 2004)
  - Significant reduction of anti hypertensive treatment (Miller BW et al. 2002)
  - Improvement of restless leg syndrome (Mortazavi M et al. 2013)
Physical Activity during Dialysis (2)

- Nutrition
  - Improvement of **nutritional status** and **quality of life** (Dialysis and comorbidity → Pro inflammatory state) (*Matsumoto Y et al. 2007*)

- Oxidative Stress
  - Improvement of the **Oxydant Status** (Atherosclerosis, denutrition, inflammation, accelerated aging process) (*Kenneth et al. 2010 ; Pechter et al. 2003; Groussard, Rouchon Isnard et al. 2015*)

- Quality of Life
  - Physical Activity is correlated with reduction of **depression score** (*Harris AH, et al. 2006, Song WJ et al. 2012*)
Auvergne Typical Food: Truffade
Physical Activity Program

- Twice a week
- 20-30 minutes
- No resistance
Inclusion of Patients in the Physical Activity Program

Agreement of the patient

Voluntarily

Medical Agreement of the Nephrologist: Prescription of PA

Agreement of the Cardiologist, Explorations if necessary

Inclusion in the Program by the Sport’s Teacher: Céline Coutard

Functional Tests

Objectives worked with the Patient

Establishment during the Dialysis by the Nurses in charge of the Patient
15 Dialysis centers
500 HD patients
40% cycling
≈ 125 patients
Results at 3 Months

Isoprostanes

Results at 3 Months

TG level significantly reduced in EX (-23%)
Results at 6 Months

- 6’ cycling test
  - Evaluation of the functional capacity of the patient.
  - Adapted from the 6'Walk Test.
  - Easily reproductible during dialysis.

![Graph showing 6 Minutes Cycling Test T0-T6 comparison with a 26% increase and a P<0.05 significance level.](Image)

Rouchon Isnard M, ASN 2014.
- 130 000 euros / year

Rouchon Isnard M, ASN 2014.
Quality Of Life: SF 36 QD

- Improvement of the limitations due to Physical status (RP) and Psychological status (RE)
- BP : Body Pain
- MH : Mental Health

Rouchon Isnard M, ASN 2014.
# 1 Year Regular Perdialysis Cycling

<table>
<thead>
<tr>
<th></th>
<th><strong>CON (n = 40)</strong></th>
<th><strong>EX (n = 40)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>M0</strong></td>
<td><strong>M12</strong></td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td>67,65 ± 13,4</td>
<td>66,8 ± 10,6</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>23m, 17f</td>
<td>27m, 13f</td>
</tr>
<tr>
<td><strong>Charlson comorbidity index</strong></td>
<td>5,22</td>
<td>5,23</td>
</tr>
<tr>
<td><strong>Ischemic cardiopathy</strong></td>
<td>3 (7,5%)</td>
<td>7 (17,5%)</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td>12 (30%)</td>
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</tr>
<tr>
<td><strong>Hypertension</strong></td>
<td>33 (82,5%)</td>
<td>34 (85%)</td>
</tr>
<tr>
<td><strong>Anti HTA treatments</strong></td>
<td>1,35 ± 1,02</td>
<td>1,22 ± 1,02</td>
</tr>
<tr>
<td><strong>Hemoglobin (g.dl⁻¹)</strong></td>
<td>11,79 ± 1,01</td>
<td>11,70 ± 1,17</td>
</tr>
<tr>
<td><strong>ESA doses</strong></td>
<td>89,63 ± 77,3</td>
<td>110,83 ± 70,8</td>
</tr>
<tr>
<td><strong>Time on dialysis (month)</strong></td>
<td>63,6 ± 11,31</td>
<td>63,4 ± 3,53</td>
</tr>
<tr>
<td><strong>Dialysis prescription (h/week)</strong></td>
<td>12,11 ± 0,08</td>
<td>12,38 ± 1,41</td>
</tr>
</tbody>
</table>

Values are mean ± SD. CON : Control group ; EX : exercising-group
* : difference between M0 and M12, p < 0,05
** : difference between EX and CON at M12, p< 0,05
1 Year Regular Perdialysis Cycling

<table>
<thead>
<tr>
<th>Number of Hospitalization for Cardiovascular Reasons</th>
<th>Hospitalization = number of hospital stays</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX</td>
<td>3</td>
</tr>
<tr>
<td>CON</td>
<td>20</td>
</tr>
</tbody>
</table>
Figure 1: Evolution of the number of antihypertensive treatments / patient

*: significant difference between M0 and M12 in EX, p < 0.05

Figure 2: Hb evolution

*: significant difference at M12 between EX and CON, p < 0.05

Figure 3: ESA doses evolution

1 Year Regular Perdialysis Cycling

- 12 900 euros / year
What feel the patients?

- « The dialysis seems faster now I’m cycling! »
- « Walk is easier now»
- « I’ve bought a bicycle to continue at home»
- « My legs are lighter, I feel more flexible »
Peritoneal Dialysis

- Protocole 3 months.
Physical Activity for Transplanted Patients?

Jonah Lomu
All Black
2004

Post Transplantation Education Program for Transplanted Patients
2015
K/DOQI, KDIGO, ERBP Guidelines

K/DOQI Clinical Practice Guidelines 2005:
Many dialysis patients are severely deconditioned. The goal for physical activity should be moderate exercise intensity for 30 minutes most, if not all, days per week.

KDIGO Clinical Practice Guidelines 2012:
People with CKD undertake physical activity aiming for at least 30 minutes 5 times per week.

ERBP Clinical Practice Guidelines 2015:
For patients with Diabetes and CKD 3b or higher we suggest to perform individualized exercising 0.5-1 hour at least 3 times a week.
### Recommandations for patients with CKD

<table>
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<tr>
<th>Treatment goal</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Smoking cessation</td>
<td>Smoking cessation (1D)</td>
</tr>
<tr>
<td>Dietary sodium reduction</td>
<td>Individuals with CKD should receive expert dietary advice and information in an educational programme tailored to the severity of CKD and required interventions on salt, phosphate, potassium, and protein intake (18). Dietary sodium restriction might enhance the effects of ACE inhibitors and ARBs to lower albuminuria and prevent CKD progression (33).</td>
</tr>
<tr>
<td>Dietary protein restriction</td>
<td>A high-protein intake (≥1.3 g/kg of ideal body weight daily) should be avoided in adults with CKD and at risk of progression (20). Individuals with CKD should receive expert dietary advice and information in an educational programme, tailored to the severity of CKD and required interventions on salt, phosphate, potassium, and protein intake (18).</td>
</tr>
<tr>
<td>Weight management</td>
<td>Achievement of BMI 20-25 kg/m² according to country-specific guidelines (1D)</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Encourage physical activity compatible with cardiovascular health and tolerance, aiming for at least 30 min of five times per week (19). A 15% reduction of all-cause mortality was found among patients with CKD who did the minimum amount of exercise (average 15 min of moderate intensity) compared with those who did no exercise at all. The effect is expected to be much greater when patients undertake 30 min of exercise five times per week. (19).</td>
</tr>
</tbody>
</table>

Each recommendation is graded (1, recommended; 2, suggested; no number, not graded) and the quality of the supporting evidence is rated (A, high; B, moderate; C, low; D, very low), according to guidelines from the European Society for Paediatric Nephrology (ESPGHAN) and the National Kidney Foundation (NKF) Kidney Disease Outcomes Quality Initiative (K/DOQI). 

CKD—chronic kidney disease, ACE-angiotensin-converting enzyme, ARB—angiotensin receptor blockers, eGFR—estimated glomerular filtration rate, BMI—body mass index.
CONCLUSION

- Physical Activity is a simple way to improve cardiovascular factors
- It allows people to create social connections
- And it saves money…
Thank you for your attention

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