University of Pavia
Medicine and Surgery Course
Department of Brain and Behavioural Science

‘Emilia Martignoni’ Memorial Award

“If a man has lost a leg or an eye, he knows he has lost a leg or an eye; but if he has lost a self—himself—he cannot know it, because he is no longer there to know it.”

- Oliver Sacks, The Man Who Mistook His Wife for a Hat

Dr. Elisa Maria Piella
ALZHEIMER’S DISEASE
New Perspectives on a Growing Global Health Problem

COORDINATOR
Giovanni Ricevuti, Università di Pavia
Student Coordinators
Cristina Bizzotto (Collegio Nuovo), Elisa Piella, Università di Pavia

November 7th, 14th, 21st, 28th 2016
17.30 – 19.30
Main Lecture Hall
Collegio Nuovo - Fondazione Sandra e Enea Mattei
Lecturers

November 7th
Stefano Cappa
IUSS Pavia; IRCCS S. Giovanni di Dio Fatebenefratelli, Brescia

November 14th
Amalia Cecilia Bruni
Centro Regionale Neurogenetica, Lamezia Terme, ASP Catanzaro

November 21st
Galia Tanay
Tel-Aviv University

November 28th
Grazia Dell’Agnello
ElI Lilly Italia
Stefano Govoni
Università di Pavia
MOVIE THERAPY

UN ITINERARIO NEL MONDO DELLA MEDICINA - ATTRAVERSO IL FILTRO DELLA PELLICOLA CINEMATOGRAFICA

- A Dangerous Method by David Croneberg
- A Heavy Heart (Herbert) by Thomas Stuber
- Awakenings by Penny Marshall
- Contagion by Steven Soderbergh
Central nervous system injury induced immune deficiency syndrome: role in stroke neuro rehabilitation

Relatore: Prof.ssa Cristina Tassorelli

Candidato: Elisa Maria Piella
Matricula: 428816

Anno accademico: 2019/2020
Interaction CNS – Immune System

- After CNS injury:
  - Local release of immune modulators
  - Activation of the hypothalamo – pituitary – adrenal axis
  - Disregulation of the SNS and PNS
  - Release of noradrenaline and glucocorticoids

**Stroke-induced immunodepression**

- Lymphopenia (≤ 1500/µl)

- Increased infectious risk e poor functional outcome in Stroke Unit
<table>
<thead>
<tr>
<th>Study population in T0</th>
<th>Total Patients</th>
<th>GROUP WITHOUT LYMPHOPENIA</th>
<th>GROUP WITH LYMPHOPENIA (≤1500/µl)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>56</td>
<td>39 (69,6%)</td>
<td>17 (30,4%)</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>70,7</td>
<td>68,0</td>
<td>77,0</td>
<td>0,007</td>
</tr>
<tr>
<td>Sex (male)</td>
<td>31 (55,4%)</td>
<td>22 (56,4%)</td>
<td>9 (52,9%)</td>
<td>1,000</td>
</tr>
<tr>
<td>Ischemic stroke</td>
<td>42 (75,0%)</td>
<td>32 (82,1%)</td>
<td>10 (58,8%)</td>
<td>0,094</td>
</tr>
<tr>
<td>Side of the lesion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>27 (48,2%)</td>
<td>19 (48,7%)</td>
<td>8 (47,1%)</td>
<td>0,251</td>
</tr>
<tr>
<td>Right</td>
<td>24 (42,9%)</td>
<td>15 (38,5%)</td>
<td>9 (52,9%)</td>
<td></td>
</tr>
<tr>
<td>Bilateral</td>
<td>5 (8,9%)</td>
<td>5 (12,8%)</td>
<td>0 (0,0%)</td>
<td></td>
</tr>
<tr>
<td>NIHSS</td>
<td>7,5</td>
<td>6,3</td>
<td>10,3</td>
<td>0,006</td>
</tr>
<tr>
<td>FIM</td>
<td>68,1</td>
<td>74,4</td>
<td>53,6</td>
<td>0,008</td>
</tr>
<tr>
<td>Barthel Index</td>
<td>40,4</td>
<td>46,7</td>
<td>26,2</td>
<td>0,010</td>
</tr>
<tr>
<td>Tinetti Balance Score</td>
<td>9,9</td>
<td>11,8</td>
<td>5,5</td>
<td>0,011</td>
</tr>
<tr>
<td>Hauser Index</td>
<td>6,6</td>
<td>6,2</td>
<td>7,7</td>
<td>0,059</td>
</tr>
</tbody>
</table>

NIHSS = National Institute of Health
FIM = Functional Independence Measure
Effect of rehabilitation and the presence of lymphopenia on the outcome score

- Significant improvement of the score in the whole population
- Significantly better scores in the population WITHOUT LYMPHOPENIA
- Presence/absence of lymphopenia wasn’t a predictor of the rehabilitation treatment’s efficacy

**NIHSS** before and after the rehabilitation

<table>
<thead>
<tr>
<th>ANOVA per misure ripetute</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>T0 vs. T1</td>
</tr>
<tr>
<td>Group</td>
<td>With/Without lymphopenia</td>
</tr>
<tr>
<td>TIME X GROUP</td>
<td>Interaction</td>
</tr>
</tbody>
</table>
**Take-home messages: Lymphopenia in the sub-acute phase**

1. Prevalence of 30%, older and more disabled population
2. Possible onset even in the sub-acute phase
3. Increased incidence of infectious complications → pneumonia
4. Predictor of disability, but recovery capacity comparable to patients without lymphopenia

5. At the discharge:
   - percentage of patients returning home significantly lower
Prediction of Infectious Complications during Stroke Rehabilitation

Elisa Maria Piella¹,²; Andrea Morotti¹,²; Roberto De Icco¹,²; Carlotta Dagra¹,²; Daniele Martinelli¹,²; Micol Averall¹,²; Marta Allena¹; Silvano Cristina¹; Beatrice Dal Fabbro¹,²; Fabio Blandini¹; Cristina Tassorelli¹,²

1 – Neurorehabilitation Unit, IRCCS Mondino Foundation, Pavia, Italy
2 – Department of Brain and Behavioral Sciences, University of Pavia, Pavia, Italy
3 – ASST Valcamonica, Ospedale di Esine (BS), UOSS Neurologia
Future perspectives

• Collaborating with the Mondino Institute about:
  o Stroke-induced immunodepression → 150 patient, ready for the statistic
  o Connection between headache disorder and the melatonin secretion
Previously:
• Physical and Rehabilitation Medicine residency (Pavia)

Soon:
• Starting the Neurology residency (Torino)
Thank you