The European Male Ageing Study (EMAS)

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MICRA: Male Ageing Seminar

FCW Wu & JD Finn
Andrology Research Unit
School of Biomedicine
The University of Manchester
Background

1. Rationale for an all-male study

- Male life expectancy 5 – 12 years shorter than for females
- Onset of age-related disease 4 – 5 years earlier in males
- Health of ageing women deeply influenced by the menopause: ageing men’s health presents an important scientific opportunity to study the mechanisms of ageing and chronic diseases with their relatively shorter healthspan, unencumbered by a menopause
- Health of ageing men has been studied to a far lesser extent than women (WHI, Nurse Health, Million Women, SWAN and MERI)
Background

2. The unanswered questions in 2002

• Why do some individuals age “better” than others?
• Are there geographical differences in how men age?
• What role do hormones play in determining how men age?
• Can the medical profession intervene to improve the quality of life and health of men as they age?
Aims

• Describe the variation in male sex hormone levels by age and geographical region

• Examine the influence of socio-demographic, lifestyle, co-morbidity and genetic factors on variation in male sex hormone levels

• Determine the influence of male sex hormones in explaining variations in health outcomes

• Investigate the mechanism by which declining male sex hormone levels exert their effects on health

• Explore if changes in circulating hormone levels can predict the development of clinical symptoms or disabilities such as frailty and fractures associated with ageing
The European Male Ageing Study: prevalence, incidence and geographical distributions of symptoms of ageing in men and their psychosocial correlates (EMAS) is conducted under ethical approval MREC 01/08/95 granted by the North West Multi-centre Research Ethical Committee.
Subjects

- Random population sample
- Community-dwelling men age-stratified by decades 40-79 years
- 8 countries in Europe
EMAS centres
Measurements

- General health assessment
- Lifestyle
- Diet
- Medical history
- Current medication
- Vision
- Blood pressure

- Blood assessments
- Bone health
- Body composition
- Physical function
- Sexual function
- Cognition
- Pain
Standardisation & Quality Control

• Standard Operations Procedures (SOPs) adopted in all centres

• “Culture fair” instruments selected

• Questionnaires translated and back-translated

• Equipment centrally purchased and regularly calibrated

• Performance of tests monitored and checked at regular workshops

• Centralised analysis of data
Data collection: timeline

- Pilot
- Baseline
- Follow-up

Mean follow-up time = 4.5 years

Timeline:
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
Selected results
EMAS Participants

<table>
<thead>
<tr>
<th>Centre</th>
<th>Age band</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 - 49</td>
<td>50 - 59</td>
<td>60 - 69</td>
<td>70 &amp; over</td>
<td></td>
</tr>
<tr>
<td>Florence, Italy</td>
<td>100</td>
<td>124</td>
<td>105</td>
<td>104</td>
<td>433</td>
</tr>
<tr>
<td>Leuven, Belgium</td>
<td>102</td>
<td>115</td>
<td>118</td>
<td>116</td>
<td>451</td>
</tr>
<tr>
<td>Lodz, Poland</td>
<td>85</td>
<td>114</td>
<td>100</td>
<td>112</td>
<td>108</td>
</tr>
<tr>
<td>Malmo, Sweden</td>
<td>94</td>
<td>118</td>
<td>102</td>
<td>95</td>
<td>409</td>
</tr>
<tr>
<td>Handforth, U.K.</td>
<td>92</td>
<td>101</td>
<td>96</td>
<td>107</td>
<td>396</td>
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<tr>
<td>Santiago, Spain</td>
<td>101</td>
<td>100</td>
<td>102</td>
<td>103</td>
<td>406</td>
</tr>
<tr>
<td>Szeged, Hungary</td>
<td>114</td>
<td>116</td>
<td>101</td>
<td>100</td>
<td>431</td>
</tr>
<tr>
<td>Tartu, Estonia</td>
<td>111</td>
<td>116</td>
<td>115</td>
<td>93</td>
<td>435</td>
</tr>
<tr>
<td>TOTAL</td>
<td>796</td>
<td>904</td>
<td>839</td>
<td>830</td>
<td>3,369</td>
</tr>
</tbody>
</table>

Response rate = 45%
## Self-reported characteristics of EMAS participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean (SD)</th>
<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>60.0 (11.0)</td>
<td></td>
</tr>
<tr>
<td>Age left education</td>
<td>20.9 (7.7)</td>
<td></td>
</tr>
<tr>
<td>Number of morbidities</td>
<td>1.2 (1.3)</td>
<td></td>
</tr>
<tr>
<td>General health good - excellent</td>
<td></td>
<td>76.6</td>
</tr>
<tr>
<td>Daily exercise ≥ ½ hour/day</td>
<td></td>
<td>65.3</td>
</tr>
<tr>
<td>Current smokers</td>
<td></td>
<td>21.1</td>
</tr>
<tr>
<td>Heart condition</td>
<td></td>
<td>16.6</td>
</tr>
<tr>
<td>High blood pressure</td>
<td></td>
<td>29.0</td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td>7.7</td>
</tr>
</tbody>
</table>
Body Mass Index (BMI)

BMI:
- 18.5 to less than 25 = normal
- 25 to less than 30 = overweight

Bar chart showing BMI data for various cities, including All, Manchester, Florence, Leuven, Malmo, Santiago, Lodz, Szeged, and Tartu.
Prevalence of treated heart disease (% of EMAS population)
Prevalence of treated diabetes
(\% of EMAS population)

- All
- Manchester
- Florence
- Leuven
- Malmo
- Santiago
- Lodz
- Szeged
- Tartu
Overall assessment of physical health (SF36) by centre
Overall assessment of physical health (SF36) by age band

Population norm

<table>
<thead>
<tr>
<th>Age Band</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 - 49</td>
<td>55</td>
</tr>
<tr>
<td>50 - 59</td>
<td>50</td>
</tr>
<tr>
<td>60 - 69</td>
<td>45</td>
</tr>
<tr>
<td>70 &amp; over</td>
<td>40</td>
</tr>
</tbody>
</table>
Mortality rates
(% of centre cohort)
Summary of health indicators

• Men in the transitional countries (Estonia, Poland & Hungary) Have markedly poorer health than the rest of the EMAS cohort

• Health declines with age
Testosterone (nmol/l) by centre

Upper limit of normal range

Lower limit of normal range
Testosterone (nmol/l) by age band

- **40 - 49**: Lower limit of normal range
- **50 - 59**: lower limit of normal range
- **60 - 69**: lower limit of normal range
- **70 & over**: lower limit of normal range

Upper limit of normal range: 30 nmol/l