Increased mortality in patients at Resource centre for hormone abusers

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Our main statement

• We present a nearby 10 times increase in mortality rate in patients at our Resource centre, where the main causes of death are heart disease and drug poisoning.

• An expansion of Resource Centres is in our opinion one of the most urgent ways to break the threatening premature death curve among AAS-abusers.
Anabolic Androgenic Steroids

Who cares??
Hormone doping with Anabolic Androgenic Steroids (AAS)... is today a society problem...
...with its extension among ordinary young people...

...at the gyms...
…in particular among males in the ages of 17-35 years…
...not seldom suffering from mixed substance abuse with narcotics, alcohol and/or other medication...
...which can exacerbate the side-effects
The knowledge of the background and the effects of hormone doping have increased the last years.
The somatic side-effects are now rather well mapped out, as are the nature and mechanisms of the psychic side-effects…
...but still reliable knowledge is lacking concerning the long-term effects including mortality.
Anabolic Androgenic Steroids

Why not??
Cardiovascular effects

Lipid pattern disturbed;
↑ concentration of LDL,
↓ concentration of HDL
↓ concentration of apoprotein A1.

Hypertrophy of cardiac left ventricle
Creation of a hyper-androgenic status destroys the feed-back systems.

- sexual function down
- testicular atrophy
- infertility
- disfiguring gynecomastia
Dependence

- AAS affects the reward system in the brain, with same neurotransmitters (dopamine etc.) as heroin/amphetamine/cocaine.
- AAS doesn’t give acute intoxication, but a slow rewarding effect.
- Many AAS-users experience difficulties to quit and similar withdrawal symptoms as in other drug addiction.
Positive reinforcement:

Hypomania/mania
↑ energy, ↓ tiredness

↑ sexual desire and ability

Ability to train through pain
Loss of control

Compulsive drug use; avoiding discomfort, preventing withdrawal.

Heavy mood swings.

Suspicious and paranoid mind.
Psychic side-effects - out of AAS
Withdrawal symptoms
Anxiety
Apathy
Substance abuse
Loss of energy
Impotence
Depression
Sometimes no wish to live on
Depression caused by AAS

• Hard to cure
• Combine several anti-depressive agents in high doses for long periods
• Might need Pregnyl (choriogonadotropin) to raise Testosterone-level
Treatment for AAS-abuse

Thus, the knowledge of AAS use and its cure have been low in Sweden.
Resource Centre for Hormone abusers

Sahlgrenska Hospital, Gothenburg

• Since (1998) 2002
• 150 patients
Resource Centre for Hormone abusers

Endocrinologist Thord Rosén

+ Social assistent
First visit at Resource Centre

For each patient:

- 2-3 hours
- Medical history incl AAS-drugs
- Perform a medical examination
- Lab-tests: Routine and hormone analyses incl AAS/urine
- ECG/UCG
- Questionnaires
Resource Centre (Pros)

• High local knowledge of AAS
• Referral Centre
• Recruit new patients from old patients
• General support of the patients
Connection to other clinics

- Psychiatry
- Cardiology
- Internal medicine
- Plastic Surgery
- Orthopedic Surgery
- Dermatology
Aim of the study

• Study mortality rate in the patients at our Resource Centre compared to the general population.
• Study morbidity (in-and out patient clinics).
• Describe the patients’ AAS- and mixed substance abuse.
• Describe pros and cons of the Resource Centre.
Methods

From the National Bureau of Statistics data concerning: mortality, in- and outpatient clinics and medication was collected.
102 male patients; Mean age 27.4 years (17-53)
Reasons for patients to visit Resource Centre for Hormone abusers

Cause of general medical examination at Resource Centre for Hormone abusers

- AAS - Examination and investigation
- Testicular hypogonadism
- Gynaecomastia
- Depressive episode
- Abnormalities of heart beat
- Problems related to lifestyle
- Anxiety
- Sleep disorders
- Alcohol abuse counselling and surveillance
- Chest pain
- Drug abuse counselling and surveillance
- Symptoms involving the urinary system
- Hypothyroidism
- Muscle strain

Number of patients
Mean age at debut of AAS-abuse
20 years (14-33) (n=102)

Age at debut of AAS-abuse

Number of patients

Age (years)

Patients

Median 19

Mean duration of AAS-abuse
6 years (0,05-30)

Duration of AAS-abuse (years)

Number of patients

[Bar chart showing the distribution of AAS-abuse duration with a median of 4.5 years.]
### Anabolic Androgenic Steroids (AAS)

<table>
<thead>
<tr>
<th>AAS-abuse</th>
<th>(n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methandrostenolone <em>(Dianabol)</em></td>
<td>79,4%</td>
</tr>
<tr>
<td>Nandrolone Decanoate <em>(Deca-Durabolin)</em></td>
<td>65,7%</td>
</tr>
<tr>
<td>Sustanon <em>(Propionate+Phenylpropionate+Isocaporate+Decanoate)</em></td>
<td>59,8%</td>
</tr>
<tr>
<td>Stanozolol <em>(Winstrol)</em></td>
<td>58,8%</td>
</tr>
<tr>
<td>Testosterone Enanthate <em>(Testoviron-Depot)</em></td>
<td>35,3%</td>
</tr>
<tr>
<td>Methenolene Acetate/Enanthate <em>(Primobolan/Primobolan Depot)</em></td>
<td>34,3%</td>
</tr>
<tr>
<td>Trenbolone <em>(Parabolan/Trenbolone)</em></td>
<td>32,4%</td>
</tr>
<tr>
<td>Oxymetholone <em>(Anadrol)</em></td>
<td>28,4%</td>
</tr>
<tr>
<td>Testo Undecanoate <em>(Andriol/Undestor)</em></td>
<td>22,5%</td>
</tr>
<tr>
<td>Testosterone Enanthate</td>
<td>21,6%</td>
</tr>
<tr>
<td>Omnadren <em>(Propionate+Phenylpropionate+Isocaporate+Decanoate)</em></td>
<td>20,6%</td>
</tr>
</tbody>
</table>
# Mixed substance abuse

<table>
<thead>
<tr>
<th>Substance Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAS-abuse (n=102)</td>
<td>72.5%</td>
</tr>
<tr>
<td>Mixed substance abuse</td>
<td>72.5%</td>
</tr>
<tr>
<td>Other hormones and performance-enhancing drugs</td>
<td>58.8%</td>
</tr>
<tr>
<td>GH</td>
<td>35.3%</td>
</tr>
<tr>
<td>Ephedrine</td>
<td>31.4%</td>
</tr>
<tr>
<td>Clenbuterol</td>
<td>28.4%</td>
</tr>
<tr>
<td>Insulin</td>
<td>18.6%</td>
</tr>
<tr>
<td>Thyroid hormones</td>
<td>10.8%</td>
</tr>
<tr>
<td>IGF-1</td>
<td>6.9%</td>
</tr>
<tr>
<td>Narcotics</td>
<td>53.9%</td>
</tr>
<tr>
<td>Amphetamine</td>
<td>36.3%</td>
</tr>
<tr>
<td>Gamma-hydroxybutyrate (GHB)</td>
<td>32.4%</td>
</tr>
<tr>
<td>Cocaine</td>
<td>23.5%</td>
</tr>
<tr>
<td>Marijuana/Cannabis</td>
<td>22.5%</td>
</tr>
<tr>
<td>Ecstasy</td>
<td>17.6%</td>
</tr>
<tr>
<td>Smoking</td>
<td>34.3%</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>44.1%</td>
</tr>
</tbody>
</table>
Mean Cumulative doses AAS
200 grams (0,9-2359,4) (n=102)
The group with the largest cumulative doses AAS tends to prefer a mixed substance abuse with other hormones and performance-enhancing drugs.

Parts of patients (%) suffering from mixed substance abuse

- Group 1 (n=34) (AAS = 516 grams)
- Group 2 (n=34) (AAS = 70.7 grams)
- Group 3 (n=34) (AAS = 11.9 grams)
- Total (n=102) (AAS = 200 grams)
The group with "middle" cumulative doses AAS tends to prefer a mixed substance abuse with narcotics.
A nearby 10 times increase in mortality rate in patients at Resource centre

The differential between the expected number (0.72) and the observed number (7) of deaths
Cause of mortality

• Heart disease
• Poisoning by heroin, drugs and narcotics
• Disorders due to use of alcohol or opioids, dependence syndrome
• Unknown cause of mortality
# Mortality according to death certificates

<table>
<thead>
<tr>
<th>Year</th>
<th>Age</th>
<th>1:st cause of mortality</th>
<th>2:nd cause of mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>23</td>
<td>R998 Unknown cause of mortality</td>
<td>F102 Mental and behavioural disorders due to use of alcohol Dependence syndrome</td>
</tr>
<tr>
<td>2006</td>
<td>27</td>
<td>I251 Atherosclerotic heart disease</td>
<td>T404 Poisoning by Other synthetic narcotics (Pethidine)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T402 Poisoning by Other opioids (Codeine/Morphine) / F112 Mental and behavioural disorders due to use of opioids Dependence syndrome</td>
</tr>
<tr>
<td>2007</td>
<td>47</td>
<td>I258 Other forms of chronic ischaemic heart disease</td>
<td>T424 Poisoning by Benzodiazepines</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F112 Mental and behavioural disorders due to use of opioids Dependence syndrome</td>
</tr>
<tr>
<td>2008</td>
<td>28</td>
<td>I258 Other forms of chronic ischaemic heart disease</td>
<td>T438 Poisoning by Other psychotropic drugs, not elsewhere classified</td>
</tr>
<tr>
<td>2008</td>
<td>27</td>
<td>T401 Poisoning by Heroin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>24</td>
<td>T401 Poisoning by Heroin</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>26</td>
<td>T401 Poisoning by Heroin</td>
<td>R782 Finding of cocaine in blood</td>
</tr>
</tbody>
</table>

**Mean age 28.8 years**
Number of patients diagnosed as inpatients in hospital once or more in Year 1999-2008

F10-F19 Mental and behavioural disorders due to psychoactive substance use
T36-T50 Poisoning by drugs, medicaments and biological substances
S00-S09 Injuries to the head
T51-T65 Toxic effects of substances chiefly nonmedicinal as to source
R00-R09 Symptoms and signs involving the circulatory and respiratory systems
F40-F48 Neurotic, stress-related and somatoform disorders
I30-I52 Other forms of heart disease
I20-I25 Ischaemic heart diseases
F30-F39 Mood [affective] disorders

1/3 of all visits at hospital 1999-2008
Number of patients diagnosed as outpatients once or more in Year 2001-2008

F50-F59 Behavioural syndromes associated with physiological disturbances and physical factors

F10-F19 Mental and behavioural disorders due to psychoactive substance use

F40-F48 Neurotic, stress-related and somatoform disorders

F30-F39 Mood [affective] disorders

N40-N51 Diseases of male genital organs

N60-N64 Disorders of breast

>1/3 of all visits 2001-2008
Anabolic Androgenic Steroids

What to do??
When suspect AAS-abuse in clinical situations?

- Heavy weight gain in short time
- Gynecomastia
- Testis atrophy
- Sexual function down-infertility
- New heavy acne
- New psychiatric problems
- Ruptures of muscles and tendons

- **Ask** every male patient <40 years of age, about smoking, alcohol, drugs **and** AAS
Practical issues:

• Ask about AAS! (smoking, alcohol, drugs).

• Confirm the AAS-abuse (history and lab.tests)

• Refer to Resource Centre
• Disturbed body image

• Narcissism (train, eat, take AAS = perfect life = hard to offer cure)
”Lost” patients

– No wish to change their ”fixed” life-style (training, specific diet, AAS)
– Not motivated to cure drug dependence
– No subjective side-effects
– No wish for return visits
Ordinary patients in health centres

- David, 28 years old
- Shoulder pain, fatigue
- Athletic body → denying AAS
- Tachycardia, ECG: T wave inversion
- Blood: ↑↑ **Testosterone**, ↓FSH/LH
- Follow-up → *information!!*
- → confessed AAS
- UCG: Left Ventricular Hypertrophy
Summary

- Our results indicate that although taking care of in a special centre, a premature mortality is noted in these patients, showing major difficulties in stopping their sometimes destructive life-style.

- An expansion of Resource Centres is in our opinion one of the most urgent ways to break the threatening premature death curve among AAS-abusers.
Thank you for your attention!