How to assess the underperforming athlete?

The Olympiatoppen Model

This is it!
**Terminology:**

- Overreaching
- Staleness
- Overload training
- Overtraining syndrome
- Underperformance syndrome
- Underrecovery syndrome
- Chronic fatigue syndrome
- The malfunctioning athlete

**The underperforming athlete**

1. Abnormal fatigue during training or recovery
2. Underperforming in training or competition
3. Condition has prevailed for >3 weeks
4. The cause is not clear
A pletoria of signs and symptoms:

- Unexplained fatigue; "my whole body is tired", "lack of energy"
- Sleep disturbances; "too much", "too little" or "irregular"
- Lack of motivation; "can’t push all the way"
- Mood changes; "easily irritable", "ambivalent", "just depressed"
- Lack of concentration; "easily distracted", "can't keep my focus"
- Frequent respiratory infections; "constant cold symptoms"
- Muscular dysfunction; "heavy legs", "stiff and soar quads"
- Loss of appetite, weight loss, and irregular menses in females
- Heart rate irregularities; at rest or during exercise

Categories of possible causes for the underperforming syndrome

1. Illnesses or health related problems
2. Increased life stress and psychosocial disturbances
3. Repeated overload training
4. Incomplete recovery and regeneration
I. Illnesses or health related problems

1. question:
Is the athlete suffering from an illness or other medical condition?

1. Possible medical conditions:
- Anemia
- Infections
- Post-viral fatigue
- Myocarditis
- Hypertrophic cardiomyopathy
- Atrial fibrillation
- Hypertension
- Hypothyroidism or other hormonal disturbances
- Asthma / allergies
- GI malabsorptions, gluten intolerance
- Eating disorders
- Insufficient caloric or micronutrient intake
- Depression or anxiety disorder
- Malignancy
- .....
2. Life stress and psychosocial stress

- Are there major disturbances of the athlete’s social and mental stability?

2. Possible psychosocial stress factors:

- Mischievous life
  - Economic problems
  - Unstable living conditions
  - Loss of a good relationship

- Too hectic life style
  - Stress from frequent travels
  - Too many obligations and tasks

- Psychological problems
  - Depression
  - Anxieties
  - Mood disturbances

- Interpersonal conflicts
  - Partner, family, team-mates, coach, friends...
3. Overload training: Too much, too hard or too often?

- Has the training schedule been over ambitious?

Possible training-related causes?

- Increase in total training hours per week?
- Increase in frequency of training sessions per week?
- Increase in # of sessions with high intensity (speed/weights..)
- Lack of proper periodization in training cycle
- Too little variation between low and high intensity
- Too little variation in modality (monotonous sessions)
4. Recovery-related causes

Has the quality and quantity of recovery measures been neglected?

Possible recovery-related causes:

- Insufficient fluid and salt intake
- Insufficient dietary intake, incl. tot calories
- Insufficient rest, muscular relaxation and massage
- Lack of mental relaxation and "de-briefing" after unsuccessful competitions
- Overinvolvement in non-sport related activities
- Lack of good-quality sleep
So, how do we assess and manage the underperforming athlete at Olympiatoppen?

Assessment and follow-up strategy

MEDICAL ASSESSMENT
History + clin invest + lab.tests

FOLLOW-UP CONSULT
Reports and additional test

MEDICAL CONDITION

NON-MEDICAL ETIOLOGY

* Ex.Physiol
* Psychol
* Nutrition
* Physio

Refere to relevant specialist

2. Follow-up
Patient history

- IT IS ALL STARTS WITH ESTABLISHING A GOOD RAPORT WITH THE ATHLETE AND SPEND ENOUGH TIME TO GET A THOROUGH PATIENT HISTORY
  - MEDICAL ISSUES
  - PSYCHOSOCIAL PROBLEMS
  - TRAINING RELATED ISSUES
  - POOR RECOVERY ROUTINES
  - REMEMBER TO GET A GOOD DIATERY HISTORY

Clinical exam

- Combination of a broader screening and targeted examination depending on the info from the patient history
- ECG at rest
- Spirometry
Blood tests

- Hb, Hct, RBC, Leukocytes, CRP
- Electrolytes, Albumin, ALAT, ASAT, LD, CK, Glu
- S-Iron, Ferritin, Vit D and B-12,
- TSH og F-T4,
- Testosteron, Cortisol, SHBG
- IgE and specific allergi testing (innhal+food panel)

Microbiological and serological test

- PCR test of saliva or serum antibodies
  - Influensa/Parainfluensa
  - Epstein Bar Virus
  - Cytomegalovirus
  - Coxackie virus
  - Enterovirus

- Bacterial swabs
Psycological assessment

- Profile Of Mood States
  - Tension
  - Depression
  - Anger
  - Vigour
  - Fatigue
  - Confusion

- Depression test

Initial assessment and treatment

- 1. If illness or medical problems are discovered: Discuss and initiate a proper treatment plan
**Initial assessment and treatment**

- 2. Discuss a proper change in training schedule
  - 1-2 weeks of just recreational exercise
- 3. Focus on fun activities, travel, get away..
- 4. Find ways to reduce stress and improve stress management

**Assessment and follow-up strategy**

**MEDICAL ASSESSMENT**
History + clin invest + lab.tests

**MEDICAL CONDITION**

**FOLLOW-UP CONSULT**
Reports and additional test

**NON-MEDICAL ETIOLOGY**
- Ex.Physiol
- Psychol
- Nutrition
- Physio

2. Follow-up

Refer to relevant specialist
Follow-up consultation

- Adjustment in treatment/follow-up plan?
- Need for psychological/nutritional support?
- Need for physiological testing?
- Ready for increased training load?
- Improvement in recovery routines?

Summing up

- Have a broad outlook on possible causes
- Obtain a thorough patient history
  - Medical
  - Psychosocial
  - Trainingload
  - Recovery and nutrition
- Use a multidisciplinary approach during the investigative phase
- Do not jump on to the first obvious explanation and be prepared to re-evaluate
## Incremental treadmill test

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## Plan for adjustment in training schedule during the first 1-2 weeks

- Discontinue all training activities?
- Reduce to 50% of normal frequency, duration and intensity
  - 50% of the days pr week (i.e. every other day)
  - 50% of total hours pr day (max 1h)
  - 50-60% of max hart rate/intensity level 1
  - 50% of normal weights, speed or watts
  - 50% of the number of repetitions and series
Plan for adjustment in training schedule

- Assess the response to the first period of reduced training load before increasing it
- Increase to 70% of normal training schedule for 1-2 weeks
  - 70% of the days per week (2 days of training-1 day of rest)
  - 70% of total hours of exercise per day (max 1.5h)
  - 70% of max heart rate
  - 70% of normal weights, speed or watts
  - 70% of the number of repetitions and series
- Remember to use a variety of training modalities

Prevention

- 1. Have realistic ambitions and goals that both you and your coach agree upon
- 2. Emphasize variation in training modes and periodization in the training schedule
- 3. Develop strategies on how to deal with training fatigue and don’t be afraid of taking a day or two off when life-stress is high
- 4. Be as diligent about your recovery routines as you are with your training schedule
- 5. Make clear life priorities and minimize non-sport stress factors
"...it was all about how I interpreted the signals of fatigue and got immediate help to deal with the serious ones"

Thank you for your attention

Heavy training loads, life stress, recovery and regeneration
An art of balancing out stressors with effective regenerative measures.....

....that may easily go wrong!
Outline

- Terminology and definitions
- Case presentation
- Categories of causal factors
- Assessment and Managing strategies: “The Olympiatoppen Model”
- Prevention strategies

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Case XC-skier

- 19 year old cross country skier. Medalist in Jr World Championship same year.
- Acute ill with high fever, fatigue, nausea, headache, increasing rash and tightness in neck movement.
- Diagnoses: ?
- Hospitalized and Rx with Acyclovir for 5 days. Relatively quick recovery but HR and BP somewhat elevated at discharge.
- Started training at low intensity 8 days after discharge. Substantially elevated HR at I level 1 (170-180bpm)
- Referred to cardiologist 1 week after he started training.
  - Blood chemistry normal.
  - ECG and Eco Doppler: No pathological findings
Case: XC-skier

- Continued training 60-90 min sessions, some days twice a day, but only low intensity. Noticeably heavy breathing, fatigued, and high HR during these sessions.
- Referred to me at Olympiatoppen in September, 3 weeks after discharge
- 1. consultation
  - History as described
  - Exam: No significant clinical findings other than some myalgia in legs and resting HR at 65 bpm
  - Additional tests?
- Possible diagnosis?
- What do you do?
  - Medical plan:
  - Training plan:

Incremental treadmill test

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Plan for adjustment in training schedule during the first 2 weeks

- Reduce to 50% of normal frequency, duration and intensity
  - 50% of the days pr week (i.e. every other day)
  - 50% of total hours pr day (max 1h)
  - Intensity level 1: Max heart rate at 160
  - Strength training once a week with 10 reps at 50% of 1RM

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HR at different running speed

Lactate levels at different running speed
Terminology III

”The mal-functioning athlete”
- Holistic approach to all aspects of an athlete’s life
- Focus on symptoms specific to an athlete
- Do not imply what may have caused the condition

The mal-functioning athlete - an increasing problem?

- Increased incidence?
  - Increased demand on total training load
  - Faster progression to elite level because of higher ambitions
  - More non-sport activities and life stress

- Increased detection?
  - More attention among athletes and coaches
  - Better detection among physicians, PT’s and psychologists

- Increased population?
  - More athletes at higher levels of performance
  - Longer athletic carriers
Variations in testosterone levels

REDUCED TO 1 SESSION PER DAY FOR 2 WEEKS

DISC. ALL TRAINING 1W

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Toppidrettsenteret / Utholdenhetslaboratoriet

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Case XC-skier: Earlier tests of VO$_2$ max

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Terminology II

- Overtraining syndrome
  - Staleness
  - Underperformance syndrome
  - Underrecovery syndrome
  - Chronic fatigue syndrome

State of performance decrement, fatigue and other symptoms of medical and psychological character that persist despite 2-3 weeks of recovery and reduced training load

Not expected or desired

Not necessarily training-induced