Dietary Supplements: Safe, Effective or Neither?

KEEP YOUR EDGE
Hockey Sports Medicine 2015
August 28, 2015

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Disclosure

• I have no relevant non-financial relationships to disclose.

• I am neither employed by nor affiliated with any supplement companies.

• I carry a dispensary in my practice in which I resell professional products.
Objectives

- What is a Naturopathic Doctor
- Mass market vs Professional supplements
- Safety and Efficacy
- 2 dietary supplement examples
What is Naturopathic Medicine?
Naturopathic Medicine

- a distinct primary health care system that blends scientific knowledge with traditional and natural forms of medicine
- after a pre-med undergraduate degree Naturopathic Doctors (N.D.’s) complete a 4 year full time Doctor of Naturopathic Medicine program and 2 sets of licensing exams
- patients undergo a full history and physical exam in addition to standard medical diagnostic investigations
Naturopathic Medicine

• individualized treatments draw from one or all of the following disciplines:
  • clinical nutrition and supplementation
  • botanical medicine
  • acupuncture and Traditional Chinese Medicine
  • lifestyle counselling
• most N.D.’s work in multi-disciplinary practices with health professionals from other regulated professions
• N.D.’s are regulated by the RHPA in Canada
Dietary Supplements
Professional

vs.

Health Food Store/
Mass Market
Supplements
Consumer Grade Supplements

- found in drug stores and health food stores
- made from cheapest components to maximize profit
- made to maximize shelf life
- laundry list of artificial colours, flavours, fillers, excipients, binders, preservatives
- include minimum amount of active ingredient for label use
Professional Supplements

• full label disclosure, including non-medicinals

• standardizations of herbal extracts to indicate primary active marker compounds

• therapeutic doses
Professional Supplements

- 3rd party testing for quality, stability, potency and purity at 3 stages:
  - raw ingredients
  - during manufacturing
  - finished product
Dietary Supplements
Safety and Regulation
Natural Health Product Labelling Laws in the USA and Canada
DNA Barcoding detects contamination and substitution in North American herbal products.

*BMC Med* 2013. Newmaster SG et al. ¹
Misleading Consumers

• 44 products tested from 12 companies
• 59% of the products contained plants not listed on the label
• 48% contained contaminants or fillers not listed on the label
• 32% of the samples contained product substitutions
• only 2/12 companies had products without substitutions, contamination or fillers
Urinary nandrolone metabolite detection after ingestion of nandrolone precursor.
Watson P, et al.

- unlisted anabolic and androgenic steroids found in dietary supplements
- adding just 2.5 mcg of 19-norandrostenedione to a creatine supplement (0.00005% contamination) resulted in a doping violation in some individuals
NSF

Certified for Sport
NSF Certified for Sport

• NHL league wide mandate helps take care of contamination issues in the locker room

• Players are still going to buy their own supplements!

• Educate, educate, educate

• BUT...does it ensure efficacy?
Supplements

Efficacy and examples
Vitamin D
Vitamin D

- steroid hormone
- by some estimates one billion people worldwide have vitamin D deficiency or insufficiency
- geographic location, sun exposure, skin colour, intestinal absorption issues and kidney disease affect vitamin D status
- serum concentration of 25(OH)D best indicator of vitamin D status
Vitamin D

- emerging evidence to support a direct impact on athletic performance via enhancement of skeletal muscle function\textsuperscript{3,4}

- good evidence to support that vitamin D deficiency indirectly affects athletic performance via immunity\textsuperscript{5}:
  - higher number of athletes presenting with URTI in deficient group
  - increased number of URTI symptoms and severity of symptoms in deficient group
Vitamin D profile in National Football League players.

• players who were released during the preseason because of either injury or poor performance had significantly lower vitamin D levels
Labs

• test serum concentration of 25(OH)D (not covered by OHIP in Ontario)
  • severe deficiency < 12.5 nmol/L
  • deficiency < 30 nmol/L
  • inadequate 30-50 nmol/L
  • adequate > 50 nmol/L
Optimal dose to increase serum 25 (OH)D levels

- Controversial!
- Close GL (2013) showed 8 weeks of 5000 IU vitamin D3 daily raised serum levels from baseline 29 nmol/L to 103 nmol/L
- Assess for intestinal absorption issues and test and retest
Probiotics

What are they?

“Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host.”

(FAO/WHO 2001)
Probiotics

Why?

- the human intestinal microbiota is a complex ecosystem
- contributes to maturation of the immune system
- provides a direct barrier against pathogen colonization
- digestion of essential nutrients
- potential cognitive and mood enhancing benefits
Probiotics

*Human or Cow?*

- **Human strains**
  - high survival rates through various stomach pH
  - maximal intestinal tract exposure

- **Cow strains**
  - weak adherence to epithelial cells
Probiotics

*Human or Cow?*

- yogurt with lactobacillus cultures is just great marketing
- patients may be able to maintain a healthy microbiome with fermented foods and yogurt cultures once replaced with human strains
Probiotic Dosing

- research appropriate strain(s) for individual situation
- probiotic activity must be guaranteed throughout production process, storage period and shelf life
- best refrigerated
The Cambridge Probiotic/Antibiotic Trial

- significant reductions of potentially harmful bacteria (coliforms, enterococci and S. aureus)
- minimized loss of lactobacilli bacteria
- significant reduction in antibiotic resistance
- 21 days of 100 billion CFU per dose
Conclusion

• It takes a village...
References

References


Thank you!

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