Cervical spine pre-treatment screening for arterial dysfunction: risks, benefits, and differential diagnosis

Roger Kerry

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What shall we talk about?

• Introduce you to Cervical Arterial Dysfunction (CAD)

• Review evidence of “old” VBI clinical model

• Back to some more CAD stuff

• Risk / Benefit review
APA to IFOMPT – what’s changed?

- “VBI”  ➔  “CAD”

- Uni-vessel assessment  ➔  System assessment

- Manipulation  ➔  Movement

- Risk assessment in context of benefit
VBI → CAD
“Cervical Arterial Dysfunction” (CAD)

Manual Therapy and Cervical Arterial Dysfunction, Directions for the Future: A Clinical Perspective

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Alan J Taylor, MSc (Sports Medicine), MCSP
Jeanette Mitchell, BSc (Physiotherapy), PhD, PGCert(HE), MCSP
Chris McCarthy, PhD, MMACP, MCSP
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Gottesman RF, Sharma P, Robinson KA, et al.

Clinical characteristics of symptomatic vertebral artery dissection: a systematic review.


Conclusions: VAD is associated with nonspecific symptoms such as dizziness, vertigo, headache, or neck pain. Ischemic stroke is the most common reported cerebrovascular complication. **VAD should be considered in the diagnostic assessment of patients presenting with dizziness or craniocervical pain**, even in the absence of other risk factors.
What’s so bad about the “old” VBI model anyway?

• It’s about “VBI”

• It’s about manipulation

• It relies on a limited assessment, centered around a poor test

• It’s missing the point!

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Do your Physio MSc at the University of Nottingham
Is manipulation risky?

No. Manipulation DOES NOT cause stroke.
“...studies have reported large effects (adjusted odds ratios 6.62, 95% confidence interval 1.4 to 304; 12.67, 1.43 to 112.0⁵)... 

...and in patients under 45 (5.03, 1.58 to 16.07⁶). However, the causal nature of this association has recently been called into question by the findings of one case-crossover study.⁷ (Wand et al, 2012)

In sum of all data: OR = about 5.00

i.e. 400% more likely to get a VAD if you have manipulation (relative risk)
Non-manipulation events of stroke (cervicogenic)

- RTA
- Hair-washing
- Rugby
- Active neck ROM
- Dentist
- Military
- Snowboarding
- Judo
- MWMs
Diagnostic utility of VBI testing
Review article

Diagnostic accuracy of premanipulative vertebrobasilar insufficiency tests: A systematic review☆☆,☆☆☆

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The “old” VBI model - summary

- ‘VBI’ is only one, very rare, pathology. There are bigger things to worry about.

- ‘VBI’ tests have no meaningful diagnostic utility

- Manipulation does not cause stroke. Other stuff does though.

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CAD asks:

• Does my patient have a vascular pathology, presenting with head/neck pain?

• How “at risk” is my NMS patient of developing a CAD pathology?
CAD Pattern Recognition

$p(\text{VBA Dysfunction})$

$p(\text{ICA Dysfunction})$
Day 1

Non-ischaemic events

Arterial trauma / somatic pain response

Ischaemic events

Hind brain neurovascular insult

• Transient hind brain ischemia symptom
• CN palsies
• Hind brain stroke

Pathological progression

Signs and Symptoms

TIME

VA trauma

Head / neck pain
ICA trauma

**Pathological progression**

- **Day 1**
  - Arterial trauma / somatic pain response
  - Peripheral neural dysfunction

- **Non-ischaemic events**
  - Head / neck pain

- **Ischaemic events**
  - Cerebral neurovascular insult

**Signs and Symptoms**

- Head / neck pain
- Horner’s syndrome / CN palsy
- Paralysis / Retinal dysfunction
System assessment – physical exam

- Blood pressure
- Cranial nerve examination
- Pulse palpation
- Eye examination
- Proprioception tests (Romberg’s; Tandem gait)
### The Nottingham CAD Classification Model (nCAD)

<table>
<thead>
<tr>
<th>Class 1:</th>
<th>Class 2:</th>
<th>Class 3:</th>
<th>Class 4:</th>
<th>Class 5:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMS pain with no or minor vascular risk factors</td>
<td>NMS pain with moderate / high vascular risk factors</td>
<td>Pre-ischemia Somatic symptoms (pain) +/- peripheral neurology</td>
<td>Early-ischemia Transient brain ischemia / cranial neurology</td>
<td>Late-ischemia with frank brain ischemia and associated neurology</td>
</tr>
</tbody>
</table>
IFOMPT CAD Clinical Reasoning

• Have you recognised a pattern and assessed system?

• Does your patient fit a CAD pathology profile? If so, REFER.

• Is your patient a good old NMS neck pain, but with some CAD risk factors? If so:
  – what can you do to minimise risk (consider mechanics of techniques / exercises)
  – What can you do to maximise benefit (consider evidence for efficacy)

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Risk assessment in context of benefit
Manipulation or Mobilisation for Neck Pain (Review)

Risk

Benefit

Evidence: Prevalence

Patient presentation

Clinical knowledge

Clinical knowledge

Evidence of efficacy (RCTs/ISRs)

AE

Patient presentation

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