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 een samenwerking tussen NVMT, NVFS & NVOF

Diagnostic accuracy of premanipulative vertebrasilar insufficiency tests. A systematic review.

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Content

- Introduction
 - Effectivity of spinal manipulation
 - Incidence of serious neurovascular complications
 - Premanipulative VBI testing
- Diagnostic accuracy of premanipulative vertebrasilar insufficiency tests
- Considerations and recommendations

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YOU TUBE

Wanneer vindt u het gerechtvaardigd dat risico te nemen.

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 - 17 JANUARI 2010

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...om van je hoofdpijn af te komen?
 - Het antwoord is simpel: nooit.

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Prof. dr. Ernst

Als er geen bewijs is dat 't helpt, is zelfs 't geringste risico onacceptabel.

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Effectivity of cervical manipulation

- There is evidence that spinal manipulation is effective in the treatment of:
 - Migraine headache
 - Chronic tension headache (only short time effect)
 - Cervicogenic headache (short and long term)
 Branfort G et al. *Cochrane Database of Systematic Reviews 2004 (update 2009)*
 - Subacute / chronic neckpain (similar effects as mobilisation) [moderate quality evidence]
 Gross A, et al. *Cochrane Database of Systematic Reviews 2010*

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Incidence



50 000 gevallen.
- Inderdaad

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Incidence

- Incidence of serious neurovascular complications
 - Case-reports
 - Between 250 and 500 cases
 - Possible tip of the iceberg
- Incidence is not known
 - 1 in 400.000 – 5.000.000 cervical manipulations

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Premanipulative VBI testing




Fig. 1. Sustained extension-rotation test
Graziano et al. 2007


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Premanipulative VBI testing

- Evaluate the adequacy of the blood supply
- Compressing the vertebral artery
- Extension rotation or rotation alone
- Examines the ability of the vertebrobasilar system to maintain adequate hindbrain perfusion
- Identify those patients at risk of serious pathology

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My Life After Chiropractic Neck Manipulation



I have a tracheotomy to enable me to breathe. I have a feeding tube in my nose because I cannot eat.

<http://sandynette.com>

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Is it possible to prevent serious complications?

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Aim of this systematic review

- To evaluate the diagnostic accuracy of the vertebrobasilar insufficiency tests by persons who will undergo cervical manipulation.

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Materials and methods

- Search in PUBMED, CINAHL and EMBASE
- Search terms related to vertebrobasilar insufficiency, vertebral artery, diagnostic parameters, spinal manipulation and movements of the cervical spine

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Materials and methods

- Inclusion criteria:
 - Studies comparing a premanipulative test with a reference test
 - Sensitivity and specificity were reported or could be calculated using a 2x2 table
 - Written in English
 - Full paper

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Materials and methods

- Evaluation methodological quality with QUADAS
- Data extraction
- Data analysis

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Results: study selection


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    graph TD
      A[Potential relevant studies identified and screened on title and abstract (n=763)] --> B[Studies excluded due to double publication or not fulfilling inclusion criteria based on abstract (n=744)]
      A --> C[Studies initially identified (n=19)]
      C --> D[Studies excluded due to double publication or not fulfilling inclusion criteria based on full publication (n=15)]
      C --> E[Studies included in the systematic review (n= 4)]
    
```

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Results: index and reference test


- Index test:
 - Extention-rotation (n=3)
 - Rotation (n=1)
- Reference test:
 - Duplex (n=1)
 - Color coded duplex (n=1)
 - Transcranial Doppler (n=2)

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Results: methodological quality


- Studies suffered from various biases
- Agreement between the two assessors was 80%
- Kappa statistic was 0.65
- Substantial agreement




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Results: sensitivity


- Sensitivity is the percentage of people with the disease, correctly identified by the screening test
- Sensitivity: 0% - 57%
 - Lack of sensitivity
 - Prevention of false negative results




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Results: specificity


- Specificity is the percentage of people without the disease and correctly negative identified by the screening test.
- Specificity: 67% -100%
 - Prevention of false positive results
 - Specificity in general sufficient, but...




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Results: positive predictive value


- Positive predictive value is the proportion of patients with a positive test result who are correctly diagnosed
- Positive predictive value: 0% - 100%
 - Positive predictive values were variable
 - Absence of false positive findings




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Results: negative predictive value


- Negative predictive value is the proportion of patients with a negative test result who are correctly diagnosed
- Negative predictive value: 26% - 96%
 - Negative predictive values were also variable



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Results: likelihoodratios

- The likelihood ratio is the likelihood that a given test result would be expected in a patient with the target disorder compared to the likelihood that that same result would be expected in a patient without the target disorder
- Above 10 and below 0.1



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Results: likelihood ratios

- Positive likelihood ratios varied between 0.22 and 83.25
 - Difficult to differentiate clearly between people with or without risk VBI
 - Also large confidence intervals
- Negative likelihood ratios varied between 0.44 and 1.40
 - Test is not feasible for ruling out VBI

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Discussion

- Inclusion criteria and execution of the tests not always sufficiently reported
- Patients not representative for private practice
- Separate groups with and without condition overestimate diagnostic accuracy (higher prevalence)

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Conclusions of systematic review:

- Diagnostic accuracy data does not support the use of premanipulative VBI tests
- A surplus value for the use of these tests has not been verified.

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And...

- The question also remains or the chance for developing complications after spinal manipulation can be predicted or that these complications are unpredictable...

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- Cassidy et al.(2008) investigated the association between chiropractic visits and vertebrobasilar artery stroke compared with primary care physician visits and the incidence of vertebral artery stroke.

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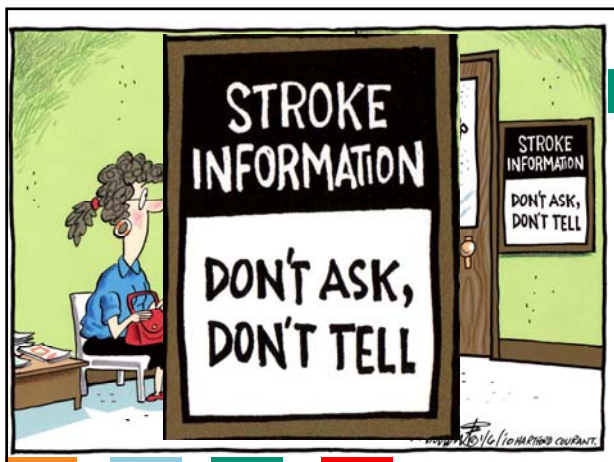
- Increased risk of vertebrobasilar artery stroke is likely due to patients with headache and neck pain from vertebrobasilar artery dissection seeking care before their stroke

Cassidy et al.(2008)

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So...

- Diagnostic accuracy is low
- No evidence of correlation between decrease in blood flow and risk of serious complications
- Serious complications are rare
- No evidence of excess risk of stroke associated chiropractic care
- Serious complications are unpredictable



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Recommendations?

- Informed consent?
- Further research on possible risk factors? (example: atherosclerosis)
- Anamnesis?
- Mobilization techniques (upper cervical spine)?

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Thank you for your attention!

Questions?