Spinal motion restriction

Question Type: Intervention

Full Question:
Among adults and children with suspected traumatic cervical spinal injury (P), does spinal motion restriction (I), compared with no spinal motion restriction (C), change neurological injury, complications, overall mortality, pain, patient comfort, movement of the spine, hospital length of stay (O)?

Consensus on Science:
POSTED FOLLOWING ILCOR MEETING TASK FORCE DISCUSSION ON 4 FEBRUARY, 2015

Cervical spinal motion restriction was defined as the reduction or limitation of cervical spinal movement. This definition may not apply to certain countries or organizations. Spinal stabilization was defined as physical maintenance of the spine in a neutral position prior to applying spinal motion restriction devices. This evaluation was limited to mechanical cervical devices accessible to first aid providers, including (semi)rigid collars and sandbags with tape, and did not include spine boards.

(Semi)rigid collar (I) vs no collar (C)

For the critical outcome of “neurological injury” we have identified very low quality evidence (downgraded for risk of bias and imprecision) from 1 non-randomized study with 5138 motorcycle crash victims, showing no difference in neurological injury (no significant difference according to the paper, however we were unable to calculate the MD and CI, because the mean and SD of the intervention and control group are not reported) (Lin, 2011, 1028).

For the critical outcome “complications (intracranial pressure)” we have identified low quality evidence from 5 non-randomized studies with 107 patients in total, showing increased intracranial pressure (MD (mm Hg) 4.69 95% CI [1.95; 7.43]; MD (mm H2O) 20.48 95% CI [5.62; 35.33]) (Davies, 1996, 647; Mobbs, 2002, 389; Kolb, 1999, 135; Raphael, 1994, 437). We identified low quality evidence from 1 additional non-randomized study with 42 healthy volunteers showing increased intracranial pressure (Internal jugular vein cross-sectional area) 0.19 95% CI [0.05; 0.33]) (Stone, 2010, 100).

For the critical outcome “complications (tidal volume)” we have identified very low quality evidence (downgraded for risk of bias and imprecision) from 1 non-randomized study with 38 patients, showing no decrease in tidal volume (significant decrease according to the paper, however we were unable to calculate the CI because the SD of the intervention and control group not reported) (Dodd, 1995, 961).

For the important outcome “cervical spine movement” we have identified low quality evidence from a non-randomized study with 18 head-injured children showing no benefit in terms of limiting flexion (MD -2.20 95% CI [-7.75 to 3.35]) (Treloar, 1997, 5). For the same outcome we identified very low quality evidence (downgraded for indirectness) from 13 additional non-randomized studies with 457 cadavers or healthy volunteers showing benefit in terms of limiting flexion, extension, lateral bending, axial rotation and flexion/extension (flexion: MD -12.50 95% CI [-13.13; -11.87]; extension: MD -0.91 95% CI [-1.18; -0.64]; lateral bending: MD -1.99 95% CI [-2.33; -1.65]; axial rotation: MD -4.73 95% CI [-5.16; -4.3]; flexion/extension: MD -19.13 95% CI [-19.89; -18.36]) (Podolsky, 1983, 461; Tescher, 2007, 1120; Tescher, 2005, 264; Horodyski, 2011, 513; Conrad, 2010, 432; Del Rossi, 2004, 619; Rosen, 1992, 412;...
For the important outcome “patient comfort” we have identified very low quality evidence (downgraded for indirectness and imprecision) from 1 non-randomized study with 26 healthy volunteers, showing no decrease or increase in patient comfort (MD -0.20 95% CI [-0.93; 0.53]) (Hamilton, 1996, 553).

We did not identify any evidence to address the important outcomes of “overall mortality”, “pain”, and the less important outcome of “hospital length of stay”.

Soft collar (I) vs no collar (C)

For the important outcome “cervical spine movement” we have identified very low quality evidence (downgraded for indirectness) from 3 non-randomized studies with 36 cadavers or healthy volunteers, showing benefit in terms of limiting flexion and axial rotation (flexion: MD -3.04 95% CI [-5.64; -0.4]; axial rotation: MD -9.07 95% CI [-14.17; -3.96]). The same studies showed no benefit in terms of extension, flexion/extension and lateral bending (extension: MD -1.63 95% CI [-4.75; 1.49]; flexion/extension: MD -8 95% CI [-21.88; 5.88]; lateral bending: MD -0.14 95% CI [-2.79; 2.52]) (Podolsky, 1983, 461; Sandler, 1996, 1624; Bednar, 2004, 251).

We did not identify any evidence to address the critical outcomes of “neurological injury” and “complications”, the important outcomes of “overall mortality”, “pain”, and “patient comfort”, and the less important outcome of “hospital length of stay”.

Sand bags and tape (I) vs no motion restriction (C)

For the important outcome “cervical spine movement” we have identified very low quality evidence (downgraded for indirectness) from 1 non-randomized studies with 25 healthy volunteers showing benefit in terms of limiting flexion, extension, axial rotation and lateral bending (flexion: MD -35.60 95% CI [-38.69; -32.51]; extension: MD -6 95% CI [-9.53; -2.47]; axial rotation: MD -73.30 95% CI [-75.99; -70.61]; lateral bending: MD -19.40 95% CI [-21.62; -17.18]) (Podolsky, 1983, 461).

We did not identify any evidence to address the critical outcomes of “neurological injury” and “complications”, the important outcomes of “overall mortality”, “pain”, and “patient comfort”, and the less important outcome of “hospital length of stay”.

The information provided is currently in DRAFT format and is NOT a FINAL version.

Treatment Recommendation:
POSTED FOLLOWING ILCOR MEETING TASK FORCE DISCUSSION ON 4 FEBRUARY, 2015

We suggest against the use of cervical collars by first aid providers (weak recommendation, very low quality of evidence).

Values and preferences statement:
• Consistent with the First Aid principle of preventing further harm, the potential benefits of a cervical collar do not outweigh harms such as increased intracranial pressure and the consequences of unnecessary neck movement.
• We recognize that first aid providers might not be able to discriminate between high or low risk individuals.
• We recognize the potential value of manual stabilization in certain circumstances, but this was not evaluated in this review.

CoSTR Attachments:
SPINAL IMMOBILIZATION_CoSTR_08122014.pdf
Share Your Comments

Please Read Carefully

Due to our conflict of interest policies, we can only allow comments that include the following:

- Name
- Email Address
- Employer
- Any Financial Relationships to Health-Related Companies

(Please specify or state "none". Financial relationships include stock, consulting, speakers’ bureau, grants, or other financial relationships.)