TITLE: Corneal Cross Linking with Riboflavin for Keratoconus: Clinical and Cost-Effectiveness

DATE: 21 April 2010

RESEARCH QUESTIONS:

1. What is the clinical effectiveness of corneal cross linking with riboflavin for keratoconus?
2. What is the cost-effectiveness of corneal cross linking with riboflavin for keratoconus?

METHODS:

A limited literature search was conducted on key health technology assessment resources, including PubMed, the Cochrane Library (Issue 4, 2010), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI (Health Devices Gold), EuroScan, international health technology agencies, and a focused Internet search. The search was limited to English language articles published between 2005 and April 12, 2010. No filters were applied to limit the retrieval by study type. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS:

HTIS reports are organized so that the higher quality evidence is presented first. Therefore, randomized controlled trials are presented first. These are followed by controlled clinical trials, observational studies, and evidence-based guidelines.

One randomized controlled trial, one controlled clinical trial, six observational studies, and one evidence-based guideline related to the clinical effectiveness of corneal cross linking with riboflavin for keratoconus were identified. No studies of the cost-effectiveness of corneal cross linking with riboflavin for keratoconus were identified.
linking with riboflavin for keratoconus were identified, nor were any relevant health technology assessments, systematic reviews or meta-analyses. Studies that combined corneal cross linking with riboflavin and an additional procedure were placed in the appendix. Additional articles of potential interest can also be found in the appendix.

OVERALL SUMMARY OF FINDINGS:

Eight studies\textsuperscript{1-8} that assessed the clinical effectiveness of corneal cross linking with riboflavin for the treatment of keratoconus were identified. Study characteristics and conclusions can be found in Table 1. All eight included studies\textsuperscript{1-8} concluded corneal cross linking with riboflavin was an effective treatment for keratoconus. A National Institute for Health and Clinical Excellence guideline for the use of corneal cross linking with riboflavin and ultraviolet A recommended that the procedure only be performed in special circumstances, as there was insufficient higher quality evidence to recommend the procedure for all patients with keratoconus.\textsuperscript{9}

<table>
<thead>
<tr>
<th>Table 1: Study results – Corneal collagen cross linking with riboflavin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td><strong>Randomized controlled trials</strong></td>
</tr>
<tr>
<td>Wittig-Silva et al.\textsuperscript{1}</td>
</tr>
<tr>
<td><strong>Controlled clinical trials</strong></td>
</tr>
<tr>
<td>Coskunseven et al.\textsuperscript{2}</td>
</tr>
<tr>
<td><strong>Observational studies</strong></td>
</tr>
<tr>
<td>Agrawal et al.\textsuperscript{3}</td>
</tr>
<tr>
<td>Arbelaez et al.\textsuperscript{4}</td>
</tr>
<tr>
<td>Grewal et al.\textsuperscript{5}</td>
</tr>
<tr>
<td>Vinciguerra et al.\textsuperscript{6}</td>
</tr>
<tr>
<td>Raiskup-Wolf et al.\textsuperscript{7}</td>
</tr>
<tr>
<td>Caporossi et al.\textsuperscript{8}</td>
</tr>
</tbody>
</table>

BSCVA = best spectacle-corrected visual acuity; CXL = Corneal collagen crosslinking; D = diopter; NR = not reported; UCVA = uncorrected visual acuity

\textsuperscript{*} 12 month follow-up data were available for 37 of the 68 eyes
REFERENCES SUMMARIZED:

Health technology assessments
No literature identified

Systematic reviews and meta-analyses
No literature identified

Randomized controlled trials

Controlled clinical trials

Observational studies


8. Caporossi A, Baicocchi S, Mazzotta C, Traversi C, Caporossi T. Parasurgical therapy for keratoconus by riboflavin-ultraviolet type A rays induced cross-linking of corneal collagen:

Economic evaluations
No literature identified

Guidelines and recommendations


PREPARED BY:
Health Technology Inquiry Service
Email: htis@cadth.ca
Tel: 1-866-898-8439
APPENDIX – FURTHER INFORMATION:

Health technology assessments


Note: see Collagen Cross-Linking, page 45 and Use of Adjunct therapies With INTACS, page 52

Randomized controlled trials


Observational studies


Review articles