FINANCIAL DISCLOSURES

• NCC doing Research project as part of the NCC 2016 conference

• NCC doing Research received equipment and supplies from:
  • Optiek XL
  • Microlens
  • Bausch and Lomb the Netherlands
  • Oté
Educational purpose

To develop a program that allows Dutch and Belgium clinicians to develop research skills

By participating in clinical research conducted at the biannual Netherlands Contact Lens Congress (NCC 2016)

Educational purpose

To create an active learning environment and increase awareness of clinical research among conference attendees
AAO Fellows Doing Research

- Based on the AAO FDR programme
- Missie AAO FDR: to advance the ocular health of the public through community based research.
- Training Academy Fellows in the concepts and techniques necessary for multi-center clinical research.

Organization

- Principal investigator
- Core research group
- Investigators
Principal investigator

Selected 6 clinicians to form core research group

Taught the core research group how to conduct research

Got assistance from the AAO-FDR

Carolina Kunnen, BOptom, BHealth, PhD

Core research group

Cristian Mertz, BOptom
Jeanine Lammens
Karolien Elving, BOptom, MSc
Louise van Doorn, BOptom, MSc
Maurice Heunen, BOptom, MSc
Nienke Soeters, BOptom, PhD
Core research group

- Designed the observational study
- Aimed for maximum participation
- Gained human ethics approval

The core research group trained 43 onsite investigators on standards of good clinical research practice prior to the NCC conference.
Online ethics training

www.onderzoekswijs.nl

Investigators training

ONLINE TRAINING
Investigators training: consent form

Survey
Investigators training: disinfecting

Investigators training
Investigators training: flipping

ALLEEN RECHTEROOG

Investigators training: grading

ROODHEID EN RUWHEID
Investigators training: fluorescein

Investigators training: blue light

BLAUW LICHT 10X GEEL FILTER
Experience center

Experience center
Experience center

Sticker
Investigators

- Dutch and Belgium optometrists, contact lens specialists and students
- Online ethics training and instruction
- On site training
- At least 2 hours to conduct onsite research
- Aim as many involved for experience but disadvantage many different investigators might effect accuracy

Core research group

Active learning experience for the core group:
- Setting up a clinical study
- Conducting research
- Data analysis
- Manuscript writing
- Presentation skills
Subjects

Real life experience with clinical research

This is the perfect clinical trial for me! All I have to do is move to Siberia, become a citizen, learn the language, live in a yurt, and exist on moss and lichens!

Great! I'll check flights!

I won't go!

Subjects

- Participants 250
- Other 843

23%

77%
Mean age of 35.9 ± 12 (range 19-65)
Participants

<table>
<thead>
<tr>
<th>Principal investigator</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Research group</td>
<td>6</td>
</tr>
<tr>
<td>Investigators</td>
<td>43</td>
</tr>
<tr>
<td>Subjects</td>
<td>250</td>
</tr>
</tbody>
</table>

NCC DOING RESEARCH 2016 study aims

**Observational study** Contact lens, aging and ocular comfort associations with palpebral rough- and redness

*To evaluate the value of everting eyelids during a routine contact lens check-up*

**Questionnaire** evaluation of eyelid eversion in general CL practice

**Repeatability study** compare examiner variability in grading photographs of the palpebral conjunctiva
NCC DOING RESEARCH 2016: observational study

Introduction

Papillae

PURPOSE

Compare grading assessment of palpebral redness & roughness

• Between upper & lower eyelid
• Between lighting conditions
METHODS

Study design
• Cross sectional study

Study population
• Dutch and Belgium attendees of the Netherlands Contact Lens Conference (NCC) 2016

Inclusion criteria
• sign informed consent
• understanding of the Dutch language
• age ≥ 18 years

Exclusion criteria
• (recent) eyelid surgery
• allergy to fluorescein

Clinical Examination
• Right upper and lower palpebral roughness and redness were evaluated using a slit lamp and diffuse filter & white light

• Palpebral roughness was also evaluated using cobalt blue light with a Wratten filter after instillation of fluorescein
METHODS

Grading

• Palpebral redness and roughness were graded using 0.5 increments for the BHVI grading scale (0-4)

• 5 zones of the upper and 3 zones of the lower eyelid

NCC DOING RESEARCH 2016: repeatability study

Introduction

• Comparison of white and blue light assessment of the palpebral conjunctiva

• Slit lamp images of eyelids were reviewed and graded to evaluate repeatability
Purpose

Compare the inter- and intra-observer grading variability of slit lamp images of palpebral conjunctival roughness & redness for the upper and lower eyelid

*Inter* = between observers

*Intra* = between two moments in time

Methods

Image selection

• Slit lamp images were collected at the Netherlands Contact Lens Conference 2016 for the NCC doing Research project

• 616 out of the 2072 images were selected based on quality

• Of the 616 images 100 images were selected for grading and analysing (25 images per group)
Methods

Grading

• 2 experienced observers
• 5 zones of the upper eyelid
  3 zones of the lower eyelid
• BHVI grading scale (0-4; 0.5 increments)
• Each image was presented in a random fashion on an Ipad using Qualtrics software
• Twice graded in a period of 2±1 weeks in daylight in the same place

Results of the Questionnaire

• Visitors were asked to take part via a link on their mobile telephone
• 233 of the 1093 NCC visitors took part in the questionnaire
1. How many CL check-ups do you perform weekly?

- 15.1% perform < 10 check-ups per week
- 16.4% perform 10-20 check-ups per week
- 34.2% perform 21-40 check-ups per week
- 34.2% perform > 40 check-ups per week

2. How often do you evert the eyelids during a check-up?

- 23.0% never evert the eyelids
- 21.3% evert <25% of the time
- 12.1% evert 25-75% of the time
- 40.8% evert >75% of the time
- 2.9% only evert in specific cases
Do you use fluoresceine when you evert the eyelid?
3. Do you use fluoresceine when you ever the eyelid?

![Eyelid Images]

Analyses & Results

- **Roughness Upper Eyelid**
  - White: **0.60** (0.30-1.00)
  - Blue: **1.20** (0.86-1.70)
  - $p<0.001$

- **Roughness Lower Eyelid**
  - White: **0.50** (0.00-0.67)
  - Blue: **0.83** (0.50-1.33)
  - $p<0.001$

*Non-parametric analysis: Friedman Test and post-hoc analysis using the Wilcoxon Signed Ranks Test were applied using SPSS*
RESULTS

Palpebral roughness was scored more severe with blue light/fluorescein than with only white light for the upper and lower eyelid.

4. What findings do you notate when you evaluate the eyelids?

![Pie chart showing percentage of findings](image-url)
4. Efron grading scale

The palpebral conjunctiva of upper and lower eyelids appeared to be more red than rough (white light).

- **Upper Eyelid**
  - Redness: **0.80** (0.50-1.10)
  - Roughness: **0.60** (0.30-1.00)
  - \( p < 0.001 \)

- **Lower Eyelid**
  - Redness: **0.83** (0.50-1.33)
  - Roughness: **0.50** (0.00-0.67)
  - \( p < 0.001 \)

Values: Median (interquartile range)
6. What eyelid do you look at when grading papillae?

6. Als u papillae gradeert, waar kijkt u dan naar?

- 64.3%
- 6.1%
- 4.6%
- 25.0%

- Alleen het bovenooglid
- Alleen het onderooglid
- Boven- en onderooglid
- Ik gradeer papillae niet

NCC Doing Research
The palpebral conjunctiva of the upper eyelids were significantly more rough than the lower eyelids.

- **Roughness (white light)**
  Upper: 0.60 (0.30-1.00)
  Lower: 0.50 (0.00-0.67)
  \( p<0.001 \)

- **Roughness (blue light)**
  Upper: 1.20 (0.86-1.70)
  Lower: 0.83 (0.50-1.33)
  \( p<0.001 \)

**Values:** Median (interquartile range)

6. **What eyelid do you look at when grading papillae?**
CONCLUSION

• Palpebral roughness of the upper lid was scored significantly higher than the lower lid
• Palpebral roughness was scored more severe with blue light/fluorescein than with only white light
• However the differences are small <0.5 grades – which may not be clinically significant
• Future work will have to determine which method is more informative in relation to other clinical tests

7. From what grade do you intervene?

7. Vanaf welke gradatie (grading scale) papillae ondernemen u actie?

- Graad 0.5 of hoger: 1.5%
- Graad 1 of hoger: 2.5%
- Graad 2 of hoger: 17.8%
- Graad 3 of hoger: 53.5%
- Ik ondernemen nooit actie: 24.8%
7. From what grade do you intervene?

• How should we grade? BHVI scale? Efron scale?

• Which eyelid zone should we assess?

7. How should we grade?

Several scales
7. Which eyelid zone do we assess?

“Papillae or follicles that occur adjacent to the conjunctival fornix are to be considered normal, since they are frequently present in healthy persons”

7. From what grade do you intervene?

**BHVI scale**

Grade 2 or less is considered normal

*Or*

A change of grade 1 or more at follow up visits is clinically significant

---

5. How do you record your findings?

**Repeatability study: statistical Analysis**

- An average of the 5 zones of the upper eyelid (UL) and 3 zones of the lower eyelid (LL) was used in the analysis
- Inter- and intra-observer variability was examined with Bland-Altman plots
- Means, standard deviation (SD) and coefficient of repeatability (COR) were calculated from the distributions of differences between replicates
7. How repeatable do we grade?

**Intra observer repeatability**

The intra-observer mean difference (95% LOA) for observer 1:

- UL redness was 0.04 grade (0.61 and -0.52)
- UL roughness 0.19 grade (0.80 and -0.42) \( (p=0.10) \)
- For LL redness 0.00 grade (0.69 and -0.69)
- LL roughness 0.13 grade (0.85 and -0.58) \( (p=0.20) \)

For observer 2 the mean difference (95% LOA):

- UL redness was -0.19 grade (0.32 and -0.70)
- UL roughness 0.17 grade (0.94 and -0.59) \( (p<0.01) \)
- LL redness the mean difference was -0.02 grade (0.80 and -0.84)
- LL roughness -0.13 grade (0.69 and -0.94) \( (p=0.37) \)

5. How do you record your findings?

5. *Hoe legt u de bevindingen vast?*

<table>
<thead>
<tr>
<th>Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graderen (en noteren op kaart)</td>
<td>54.9%</td>
</tr>
<tr>
<td>Fotograferen</td>
<td>29.5%</td>
</tr>
<tr>
<td>Tekenen</td>
<td>14.5%</td>
</tr>
<tr>
<td>Alle voorgaande manieren</td>
<td>1.0%</td>
</tr>
</tbody>
</table>
5. How do you record your findings?

How reliable are we at grading photography?

The inter-observer mean difference (95% limits of agreement (LOA)):

- UL for redness was -0.19 grade (0.45 and -0.83)
- LL for redness was 0.09 grade (0.97 and -0.79)
5. How do you record your findings?

**INTER-OBSERVER variability for ROUGHNESS**

The inter-observer mean difference (95% limits of agreement (LOA)):

- UL for roughness was -0.34 grade (0.58 and -1.25)
- LL for roughness -0.48 grade (0.54 and -1.50)

**CONCLUSIONS**

- A larger inter- and intra-observer variability was observed for the lower compared to the upper eyelid.
- This might be explained by the difficulty to fully evert the lower eyelid and obtain an in-focus image.

- A larger inter- and intra-observer variability was observed for roughness compared to redness.
- The larger variability in roughness might be explained by the difficulty to appreciate depth in a 2-dimensional image.
What happened next?

- BCLA Asia – same research in university
- Several presentations and publications

Presentations

Presentation at the OVN conference February 2017

By Jeanine Lammens

On the survey results NCC
Doing Research
Presentations

Presentation at the EAOO
Barcelona 2017

By Maurice Heunen

On NCC Doing Research
Project set-up

Presentations

2 presentations at the 40th BCLA conference

Maurice Heunen: Comparison of white and blue light assessment of the upper and lower palpebral conjunctiva

Karolien Elving-Kokke: Inter- and intra- observer variability in grading redness and roughness of upper and lower eyelids
Visus 1, januari 2017

Publications


Daarnaast schrijft ze columns met een wetenschappelijk tintje voor een digitaal Nederlands contactlen blad en heeft ze ervaring op het gebied van het aantrekken van medische

ONDERZOEK: 20 % VAN DE OPTOMETRISTEN KLAPT NOOT EEN OOGLID OM

Hoe vaak klappen Nederlandse contactlensspecialisten en optometristen in de (extramurale) praktijk oogleden om tijdens een routine contactlenscontrole? Tijdens het afgeholpen Nederlands Contactlens Congres (NCC) in maart is dit door middel van een enquête onderzocht. Van de respondenten gaf maar liefst 20 procent aan nooit een ooglid om te klappen.

Deur Niemie Soeters (BOptom, PhD), Jantine Lammers, Maurice Huisman (BOptom, MSic, FAQO), Elske Maria Prins (BOptom, MSic, FAQO), Karolien Blaauw (BOptom, MSic, FAQO), Louise van Doorn (BOptom, MSic, FAQO), Robin Chalmers (CIO, FAQO, FBCLA) en Carolina Kunnert (BOptom, PhD)

Papillae van de palpebrale conjunctiva zijn kleine ronde zwellingen met centrale vasculaire uiteinden. Deze ‘kwelachtige’ zwellingen kunnen verschillen in diameter en zijn makkelijk te zien bij het omkijken van het bovenooglid. Papillae worden vaak geassocieerd met oculaire allergieën. Ook kunnen ‘giant papillae’ (zwellingen > 0,3mm²) een kenmerk zijn van een allergische vorm van keratoconjunctivitis. In 1974 is de link gelegd tussen giant papillae conjunctivitis (GPC) en contactlengebruik, en werd het

Peer reviewed publications in process

- In submission Contact Lens & Anterior Eye Journal

‘Comparison of white and blue light assessment of the upper and lower palpebral conjunctiva’

- In writing: Repeatability paper
• Idea: NCC Doing Research team brainstorm


Grading scale
Titel
Contact Lens wear, Age and Ocular Comfort Associations with Fluorescein Breakup Patterns

• To assess the associations between fluorescein breakup patterns and ocular surface symptoms, contact lens wear and age

• Study type: Observational, cross-sectional study
NCC DOING RESEARCH 2018

Total number of participants .........

Visit us at the booth!!!

ACKNOWLEDGEMENTS

• Netherlands Contact Lens Congress (NCC) 2016 conference
• Eef van der Worp
• Marco van Beusekom
• NCC doing Research Volunteers:

  Annette Kuypers, Esther Prinssen-Sharpe, Gert Vanschoenwinkel, Bekah Rastegar, Nicole Ridderhof,