An aerial photograph of a city, likely London, showing a river (the River Thames) and a bridge (Tower Bridge). The image is overlaid with a semi-transparent blue filter. The text is centered and bolded.

***New treatment possibilities of  
laryngeal dystonia and related  
disorders.***

*Coordinated to Cost 2103 in the  
European Union, work group 5 of  
public relations of advanced voice  
assessment*

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# Abstract

- New aspects of the role of the signal processing from the larynx in mucosa in animals includes the vocal cords, as also discussed at the voice symposium in Madison July 2008 and in Stockholm 2008. We have made our analysis of 55 patients with dystonia. They were earlier elucidated neurologically in the hospital system in Denmark. Our analysis included immune system related deficiencies of the upper airway mucosa: screening of blood cells, thyroid function, D-vitamin insufficiency, allergy screening for pollen, dust and animal hair, milk, eggs, soya, wheat, nuts and fish, genetic tests for intolerance of gluten, lactose in milk, mannan binding globulin and antibodies for helicobacter bacteria (IGA or IGM and IGG). Thereafter we made a routine treatment of the upper airway disordered mucosa, that included an updated effective antihistamine (terfenadin 180mg, 2-3 tablets a day) and steroids locally (pulmicort, without lactose, standard treatment of 200micrograms) placed on the vocal cords, (3 turbo inhalations x 2 daily), for the facial dystonia also steroids in the nose (flixonase nose drops fluticazon 400microgram at least 2 times a day). The 55 patients with dystonia were divided: cervical 40F/13M, cervical + hoarseness 30F/11M, cervical + torticollis 13F/5M, facial 27F/9M, truncal 14F/7M, limbs 20F/6M, analysed and treated. A visual score was made of effect from 1-100 (%) and a division was made: no change 13, 1-25% 25, 26-50% none, 51-75% 3, 76-100% 11, not defined 3. The observation time was 3-6 months. 31F/ 13M had had botox locally earlier. 10% were satisfied with that treatment. The treatment effect was related to better all round social function. This prospective cohort study of symptoms before and after diagnosis and treatment of the upper airway immune system opens up new understanding of the role of the immune system in this kind of neurological disorders. Evidence based prospective studies are necessary in the future. A randomized controlled prospective study between botox and anti-inflammatory treatment of the upper airway could illustrate not only specific motor function skills of muscles but also an understanding of sensory aspects of dystonia.
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- **1 Pedersen M** (2008). High speed films as a diagnostic tool for voice related dystonia and tremor, a prospective case-control study. AQL Stockholm.

# Introduction

- The co-work between medical researches, e.g. ear – nose – throat specialists and other voice experts in brain research, speech pathology, acoustics and teaching is ongoing.
- The clinical aspects of immunological and pharmacological treatment is mostly in the hands of medical doctors

# Introduction

- In between, paradigm shifts do happen in pharmacological and immunological cases as when we treated our first patient with universal dystonia
- sent by a physiotherapist – not for the dystonia but to help her to breathe and speak better due to a laryngological disorder
- the dystonia disappeared when the laryngeal complaints were treated.



# Methods

- 3 groups of clients were compared in this prospective case / control study.
- 1. Patients with dystonia before and after treatment of larynx mucosal complaints
- 2. 30 amateur singers
- 3. 12 non singers

# Methods

- The traditional treatment of the laryngeal complaint was:
- Steroids, budesonid 200 micrograms with an inhaler (Pulmicort) three inhalations 2 times daily placed on the vocal cords.
- Antihistamine, Terfenadin 180 miligrams (Telfast) 2-3 tablets daily.



# Methods

- Our usual clinic system includes blood examination for:
- Blood pictures of cells
- thyroid function
- Vitamin D
- Allergy blood test (pollen, dust, animal hair, milk, egg white, fish, nuts)
- genetic tests of intolerance of lactosis and wheat and mannan binding lectin.
- Helicobacter bacteria was also examined for.

# Methods

- Our usual High Speed film measured 4000 frames pr. second with quantitative analysis of the front, middle and rear quotient and the total open area between the vocal cords
- evaluation of kymography,
- electroglottography (EGG)
- acoustical curves
- FFT (Wolf Ltd.)

# Methods

- Jitter, shimmer in MDVP and the closed phase in the EGG, with standard deviations were calculated for a sustained tone and reading of a text.
- The fundamental frequencies were automatically presented in the HighSpeed software as in MDVP (Laryngograph Ltd.)

# Material

- The control group included High Speed films and MDVP of
- 30 amateurs singers
- 18 females and 12 males supplemented by
- 12 non singers
- 9 females and 3 males
- without immunological complaints.

# Material

- 55 consecutive dystonia patients referred to the clinic prospectively in this case-control study during 8 months, were analysed 2 times with an interval of up to 3 months.
- The 55 patients with dystonia were divided into:
  - cervical 40F/13M,
  - cervical + hoarseness 30F/11M
  - cervical + torticollis 13F/5M
  - facial 27F/9M
  - truncal 14F/7M, limbs 20F/6M
- They were analysed and treated for their laryngeal complaints. Mostly an oedema of the arytenoid region was seen.

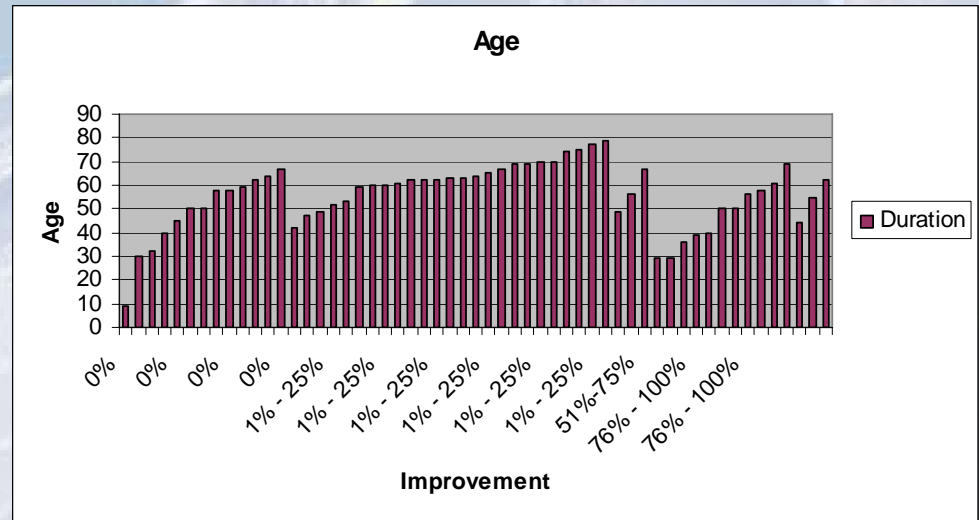
# Material

- A visual score was made of effect from 0-100 (%) and a division was made:
- no change = 13
- 1-25% = 25
- 26-50% = none
- 51-75% = 3
- 76-100% = 11
- not defined = 3
- The observation time was 3 months.

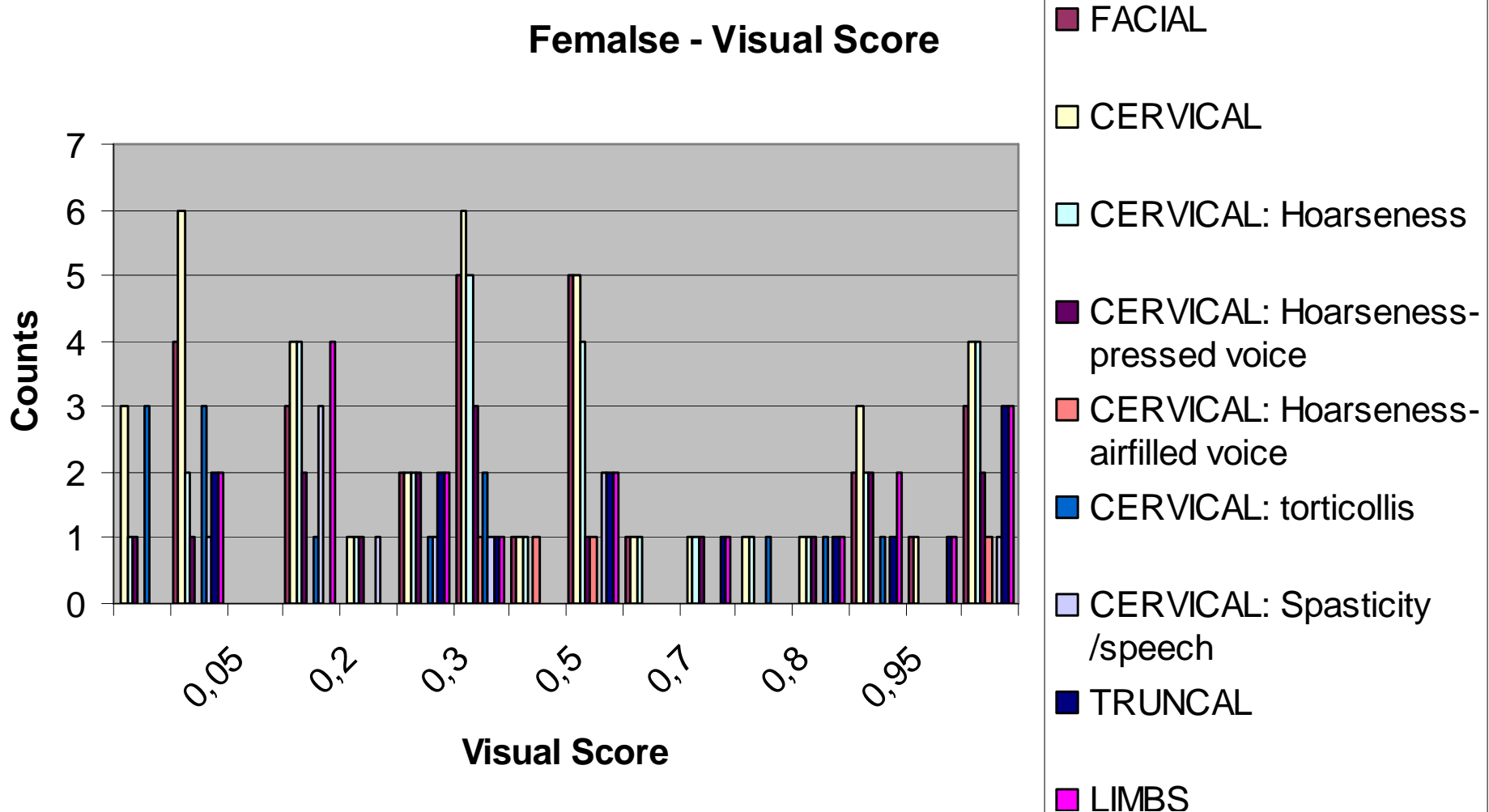


# Results

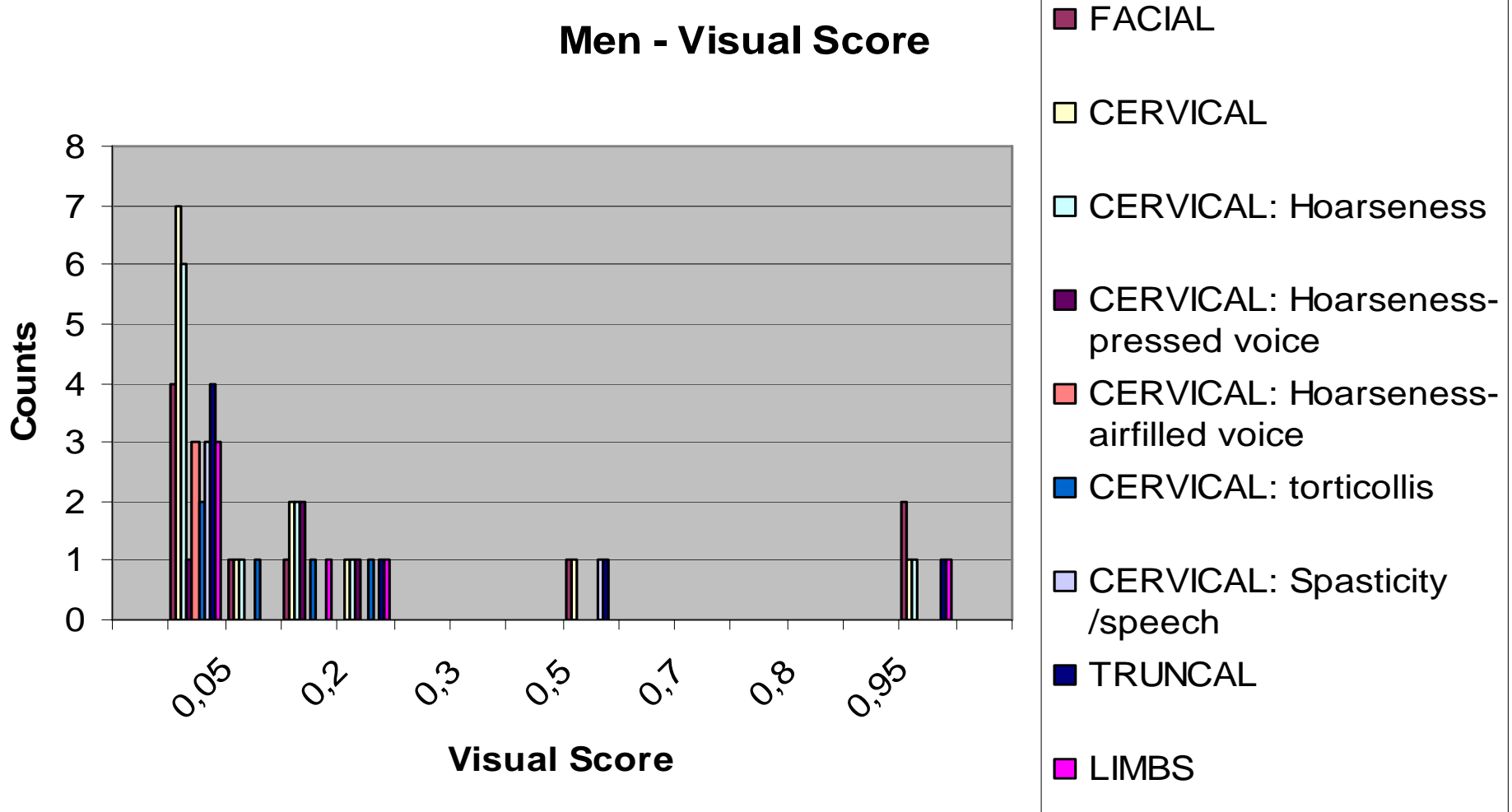
- Males 14
- Females 41
- Work 12 males and 14 females
- Botox 14 males and 36 females
- Immune system deficiencies in all



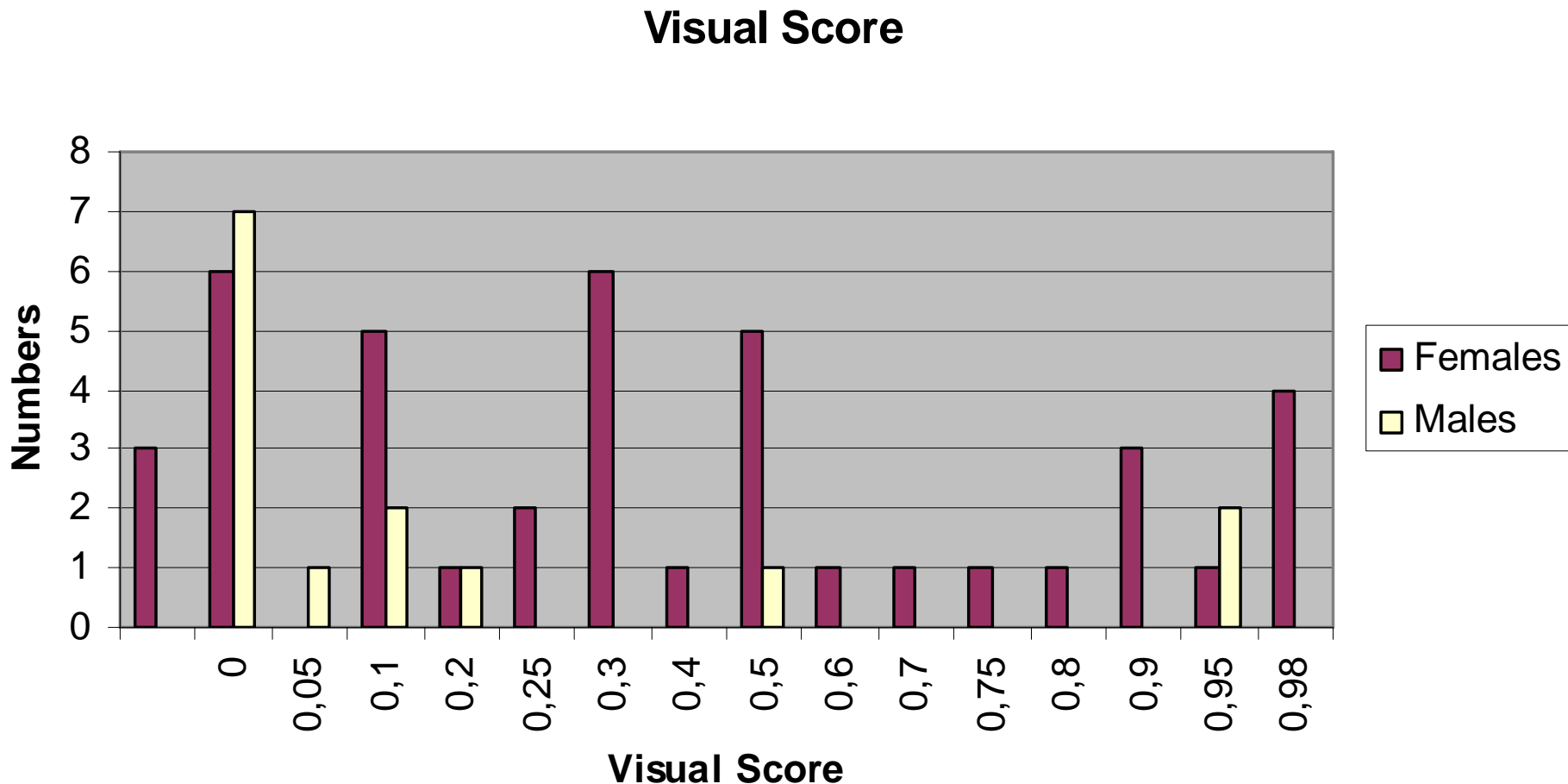
# Symptoms in Females compared with visual score of effect



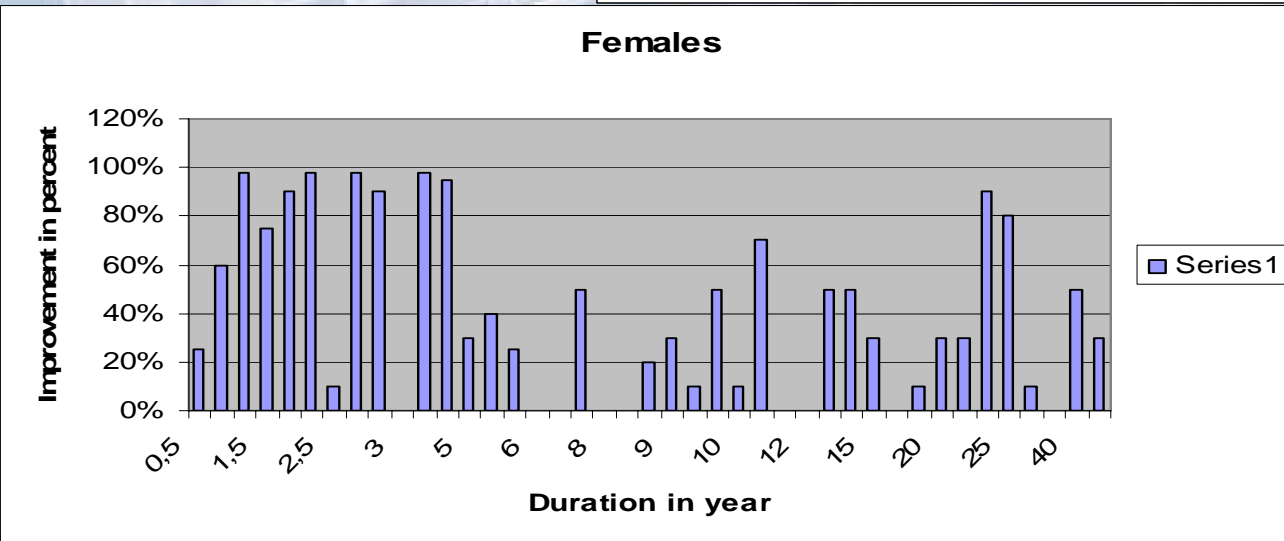
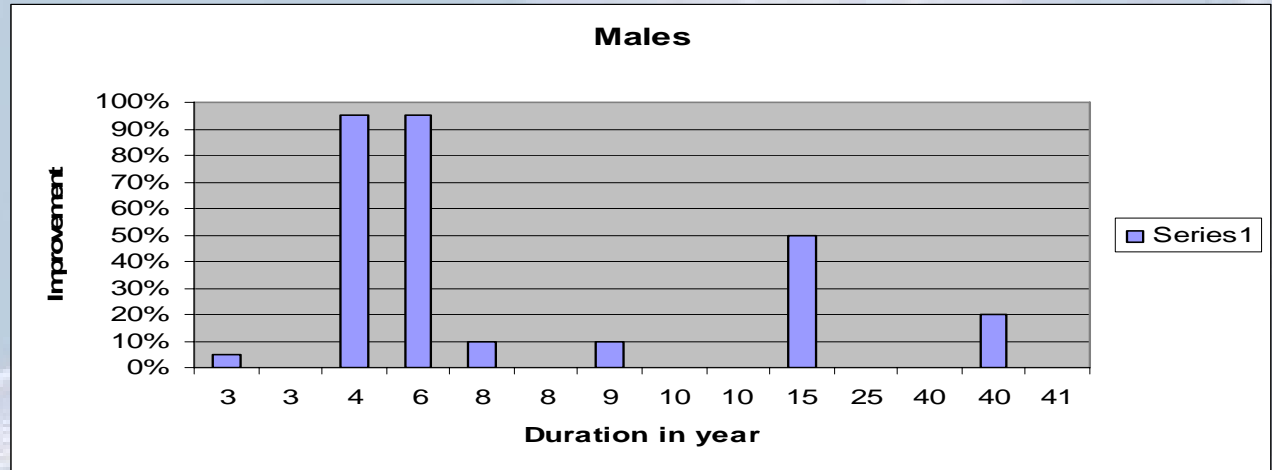
# Symptom in Males compared with visual score of effect



# Visual score of treatment effect



# Improvement



# Results

- The High Speed films changed for the quotients to a more normal wider quotient in front, middle and rear with ChiSqr test.
- Only the ANOVA test showed a trend of difference of the middle quotient of the open phase at the High Speed films, comparing the dystonia patients with non dystonia patients.



# Conclusion

- The study showed, that treatment of the larynx mucosa immune deficiencies can in some cases repair neurological dystonia symptoms in the first years, up to 6 years in this material, toward normal.
- The neurological aspects of altered voicing and slight voice complaints has been one of the results of our studies e.g. actors claiming of "wobbling" voices.

# Conclusion

- With botox, it is extremely important to treat the right muscle at the right time.
- What is also an experience is, that possible scars of neurological circuits should be documented and that such scars could be avoided by testing/treating the immune system in laryngeal dystonia and related disorders at the earliest possible time.

# Conclusion

- A randomized controlled prospective study between botox and anti-inflammatory treatment of the upper airway could illustrate not only specific pathological motor function of muscles, but also an understanding of sensory aspects of laryngeal dystonia and related disorders.

# Thanks to all coworkers and to be allowed to be here

- Special thanks to Kasper Munck, the SAS institute for statistical advice and calculations