

# Lissamine Green

- *Vitalstaining by keratoconjunctivitis sicca ?*



By Mogens Norn



And Sven Johansen

## **Why lissamine Green instead of rose bengal by obs. for sicca?**

Lissamine Green does not itch and is not painful to use. Rose bengal does itch at positive staining of the eye. Thus Lissamine Green – vital staining can be used for even further indications.

Lissamine Green stains exactly like rose bengal, i.e. devitalized and dead cells as well as mucus. If there is a minimum of difference, Lissamine Green would stain a little more than rose bengal at same

concentration (Norn: Acta Ophthal. 51.483.1973).

Lissamine Green gives a better contrast in conjunctiva (green on red), but might not be as good on cornea. Lissamine Green is immediately available, while rose bengal can be hard to come by. Lissamine Green is neither carcinogenic

or toxic, and is also used as Wool Green, Food Green and for coloration of medical products.

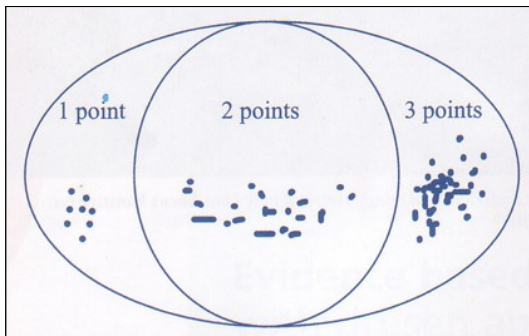
Vital staining of the outer eye is currently increasing, not just for diagnosing Sjögrens Syndrome, but also to reveal environmentally or age conditioned dry eye, before and after the use of contact lenses and for examination of the many patients who have unspecified conjunctival irritations.

## **Method**

The ideal would be 0,01 ml 1% Lissamine Green dripped from a single-dose ampule in the lower eyelid to achieve the right amount of staining of the outer eye. Eyedrops guarantee a constant concentration of lissamine.

Second best and for practical application it is perhaps easier to use a Lissamine Green strip (Lissaver-Plus), which contains 1,5 mg of dye. One drop unpreserved, sterile Saline solution 0,9% from a single-dose ampule is applied to the strip. Let the drop fall into the fornix inferior, or, as the enclosed directions for use suggest: touch conjunctiva or fornix with the moisturized tip of the strip. The directions recommend to let the patient blink the eye several times

Lissamine Green Score



Some spots: 1 point. Many separate spots : 2 points. Many close spots : 3 points.  
Each of the three areas (nasal conjunctival, corneal, temporal conjunctival) can each reach up to 3 points. Total eye surface can reach up to 9 points.  
If total score for both eyes is above 4, sample is abnormal.  
If 2 out of the 3 tests show abnormal results, then a keratoconjunctivitis sicca is possible

### **Keratoconjunctivitis sicca - Copenhagen criteria**

	Right ocular surface	Left ocular surface
B.U.T.		
Schirmer Test		
Lissamine Green		

### **Keratoconjunctivitis sicca - Copenhagen criteria**

- I. BUT ≤ 10 seconds
- II. Schirmer test 1 ≤ 5mm/5 min for both eyes (closed eyes and no anaesthetics)
- III. Lissamine Green score ≥ 4 for both eyes.

after the application and to use one or two drops. I would use just one drop and reduce the blinking to avoid any surplus running down the skin around the eyes and the cheeks. This would also reduce the amount of dye lost through the tear canals (or spray out on spectacles).

The vital staining is read interpalpebrally in a slitlamp with white light. Read it in three parts: Corneal, nasal and temporal conjunctival parts, where you give 1 point for few spots, 2 points for several separate spots and 3 points for confluent spots. A maximum of 9 points can be reached. The test is pathological at minimum 4 points.

### **Indication**

Lissamine Green can primarily be used for diagnosis of Sjögrens Syndrome 1 and 2, but also for all other forms of keratoconjunctivitis sicca. E.g. lack of Vitamin A and the age-paradox: the eyes are watering when outdoors and the elderly will complain about dry eyes indoors. Vital staining using Lissamine Green does not only reveal a dry eye. It is also possible to study the Marx Line as the waterphase at the eyelid and the punctum lacrymale is stained, while the lipid phase in front as well as the Meibom Glands stays un-

stained. With the elderly it can be found that the Marx line has become irregular like wrinkles on the skin. Starting trichiasis, a tendency of ectropion and entropion is revealed, study of the location of the tear points.

An erosion of the cornea is stained in the rim by Lissamine Green in the same way as devitalized cells, dead cells and mucus. Here it is evident though that fluorescein vital staining studied in blue light is more sensitive. Fluorescein penetrates where there is an epithelial defect and spreads to the surrounding tissue which enhances the inflicted area. This is similar to a herpeskeratitis.

### **Discussion**

Vital staining with Lissamine Green is harmless. There is no lasting stain (tattoo), but the eyelids and cheeks may be coloured.

Lissamine Green is not particularly soluble in water. If a discoloration of the skin does not come off by gentle washing, it is recommended to apply and wipe off an oil or ointment to remove residues of color.

Vital staining with strip does not deliver a precise dose. Eyedrops of exact size is not

that accurate either as dosage will depend on the following blinking of the eye. Lissamine Green can however only reach at maximum a concentration of 2% due to the limited ability to dissolve in water. This is in opposition to rose bengal which in a 10% concentration will dye even normal eyes as being dry, leading to a false positive diagnosis.