Introduction

- Stevens Johnson Syndrome (SJS) and its more severe form Toxic Epidermal Necrolysis (TEN) are rare but life-threatening diseases affecting skin and at least two mucous membrane sites including ocular surface, oral cavity, and genitourinary due to drug reactions.

- SJS is defined when the detached cutaneous surface covers less than 10% of the Body Surface Area (BSA). TEN involves more than 30% of BSA.

- The overall reported incidence rate of SJS ranges between 14 to 6 cases per million person per year. Almost 79% of patients of SJS will have severe chronic ocular sequelae of SJS.

- The lipid layer produced by meibomian glands helps to protect the tear film from the evaporation of the aqueous phase and to stabilize the tear film. Therefore, Meibomian lipid is necessary in maintaining the ocular surface health and integrity.

Aim

- To measure the lipid layer thickness and Meibomian gland dropout and to correlate lipid layer thickness with subjective and objective measurements of dry eye in patients with Stevens Johnson Syndrome (SJS).

Methodology

- A cross-sectional observational study was carried out on Sixty patients (120 eyes) who were diagnosed as SJS. Oral and written consent form was obtained from all the patients. All the patients had undergone comprehensive eye examination along with subjective and objective measurement of dry eye.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Measurement Tool and cut-off value</th>
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<tbody>
<tr>
<td>Dry eye symptoms</td>
<td>SPEED questionnaire: SPEED score was graded no symptoms (SPEED=0), mild-moderate (SPEED=1-7) and severe (SPEED&gt;8) for analysis.</td>
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<tr>
<td>Lipid Layer Thickness</td>
<td>Lipview interferometry&lt;75nm as detected thinner</td>
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<tr>
<td>Meibomian gland dropout</td>
<td>Non-contact Meibigraphy: Grade 0=(no loss of MG), grade 1=(loss of MG&lt;33%), grade 2=(loss of MG between 33% to 67%) and grade 3=(loss of MG more than 67%)</td>
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<td>Tear film stability</td>
<td>Tear break-Up Time (TBUT)=&lt;10 seconds decreased</td>
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<tr>
<td>Tear production</td>
<td>Schirmer’s test-1&gt;=10 seconds decreased</td>
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<tr>
<td>Meibum Expressibility score (MES)</td>
<td>Graded from 0 to 3 where 0= all glands are expressable, 1= (glands between 3-4 are expressable), 2= (only 1-2 glands are expressable) and 3= (no Meibomian glands are expressable)</td>
</tr>
<tr>
<td>Meibum Quality score (MQS)</td>
<td>0= clear fluid 1= cloudy fluid 2= cloudy Meibum and particulate fluid 3= opaque or toothpaste-like</td>
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Results

- A total number of 120 eyes of 60 patients with the mean age of 31.1±12.9 years.
- Male: 25(41.7%) and Female: 35(58.3%)
- The duration of condition was between 1 month to 16 years
- The mean lipid layer thickness was noted to be 53.07±27.0 with lowest 15mm and highest 100um.

Discussion

- Sotozono et al. evaluated the Tear Film Lipid Layer (TFLL) using video interferometry. They reported that TFLL was found significantly thinner in patients with SJS.3
- Lipid layer thickness measured objectively with non-contact interferometer was also noted to be thinner than healthy eye in patients with SJS.
- In our study, we found that meibomian gland either in upper or lower eyelid had partial or complete dropout in all patients with SJS. The severe meibomian gland dropout was found in 65.38% of SJS patients. The similar result was reported in Shrestha et al study.4
- If the lipid layer thickness is low but gland structure shows less dropout with thicker meibum quality, then treatment options like lipiflow might be useful in SJS patients.

Conclusions

- Lipid layer thickness was noted to be thinner than the healthy eyes in patients with SJS.
- There was a significant relationship found between lipid layer thickness and other objective as well as subjective measurement of dry eye.
- Meibomian glands are significantly affected in SJS indicated by their reduced structural and functional parameters. Not only the aqueous component but also the meibum is reduced in eyes with SJS.

References


Abstract No: EHCW029

Measurement of Lipid Layer Thickness and Meibomian Gland Dropout in patients with Stevens Johnson Syndrome

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Figure 1: Lipid layer thickness measured with Lipview-II interferometer

Figure 2: Infrared Meibography Image of Meibomian gland dropout from grade 1 to 3. (A) grade-1 gland dropout <33%. (B) Grade-2 gland dropout between 33% to 67%. (C) Grade-3 gland dropout >67%. (D) Complete or total loss of Meibomian gland in some SJS patients

Figure 3: Structural Changes of Eyelid in SJS patients

Figure 4: Relatively normal position of eyelid margin with total loss of Meibomian gland

Figure 5: Posterior drooping of eyelid margin with keratinization and total loss of gland

Table showing mean values of dry eye parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean ± S.D.</th>
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<tbody>
<tr>
<td>SPEED Score</td>
<td>16.11±4</td>
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<tr>
<td>Average U(TE)</td>
<td>53.07±27.0</td>
</tr>
<tr>
<td>Schirmer 1 test (mm)</td>
<td>6.5±26.74</td>
</tr>
<tr>
<td>TBUT (sec)</td>
<td>3.3±81.90</td>
</tr>
<tr>
<td>Meibomian Quality Score</td>
<td>1.95±0.69</td>
</tr>
<tr>
<td>Meibum Expressibility Score</td>
<td>2.49±0.75</td>
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</table>

Figure 6: Grades Of Meibomian Gland Dropout (120 eyes)

Figure 7: Meibum Expressibility Score (MES)

Figure 8: Meibum Quality score (MQS)

Figure 9: Correlation between lipid layer thickness and dry eye parameters