Electron Microscopic Study of Esophageal Epithelium in Non-erosive Reflux Disease

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Introduction
Non-erosive reflux disease (NERD) is the most common phenotype of gastro-esophageal reflux disease (GERD). Dilated intercellular space (DIS) in prickle cell layer is considered as early signs of acid damage to the esophageal epithelium [1-5].

Objectives
To explore DIS in both superficial and prickle cell layer of esophageal epithelium of NERD patients and normal controls by using scanning electron microscope (SEM) and transmission electron microscope (TEM).

Materials and Methods
• The study group included 8 NERD patients (reflux symptoms, normal mucosa on endoscopy and positive 24-hour pH monitoring) and 5 normal controls.
• Endoscopic esophageal mucosa biopsies were taken 5 cm proximal to the Z line and specimens were routinely processed for SEM and TEM.
• The nature of intercellular spaces between superficial cells and prickle cell layers were viewed by SEM and TEM respectively.

Results: SEM
• Cellular attachment of superficial cells was divided into 3 grades.
• It differs significantly among control and NERD patients. p value was 0.007. (Chi-Square test, p <0.05 was considered to be statistically significant).

Results: TEM
• Morphometric analysis on TEM microphotographs (Figure 4,5) showed mean intercellular space diameter values of NERD patients were significantly (two times) higher than those in normal controls (p<0.001) in prickle cell layer using student’s t test. (Table 1).

Table 1: The intercellular space of 13 subjects.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Intercellular spaces (μm)</th>
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<tr>
<td>Control (n=5)</td>
<td>Mean  Maximal  Minimal</td>
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<td>0.65 (± 0.17)  0.86 (± 0.30)  0.44 (± 0.16)</td>
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<tr>
<td>NERD (n=8)</td>
<td>1.39 (± 0.32)  1.66 (± 0.37)  1.13 (± 0.32)</td>
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References

Acknowledgements
A special word of gratitude should be dedicated to Research Centre, IIUM, for their research grant (EDW B 0905-278). Special thanks go to director of HTAA hospital, staffs of endoscopy unit, HTAA, staffs of Endoscopic Suite, Gastrointestinal Laboratory Unit and Electron Microscopy Unit of IIUM.