Assessment of Bone Health in patients with Eosinophilic Esophagitis

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Background

- Eosinophilic esophagitis is defined as “a chronic, immune/antigen mediated, esophageal disease characterized clinically by symptoms related to esophageal dysfunction and histologically by eosinophil-predominant inflammation”.

- No formulation of topical glucocorticoids has been approved specifically for eosinophilic esophagitis. However, both fluticasone and budesonide have been studied.

- It is a chronic remitting disorder and most patients need long-term treatment. However, long-term steroid use is associated with side effects and symptoms often recur when steroid use is discontinued.

- Relapse rate upto ninety one percent has been reported.
Background

- Common side effects reported with the use of fluticasone include candidal esophagitis and rarely herpetic esophagitis.

- Fluticasone dose more than 440mcg/day, when used for other diseases has been associated with systemic side effects including cataract, impaired growth in children and adrenal suppression.

- Inhaled corticosteroids in doses above 1.5 mg/d (0.75 mg/d for fluticasone propionate) may be associated with a significant reduction in bone density.

Systemic adverse effects of inhaled corticosteroid therapy: A systematic review and meta-analysis. Lipworth BJ. Arch Intern Med. 1999 May 10; 159(9):941-55
Purpose of the Study

• There is not enough literature about effect of topical (swallowed) steroids on bone health and especially in patients with eosinophilic esophagitis.

• Question raised: “Are these steroids safe to be used for long-term in this relapsing disorder?”

• In this study, We assessed the bone health by DEXA scan, in patients with eosinophilic esophagitis who were treated with topical (swallowed) steroids.
Inclusion Criteria

1. Patients with biopsy proven diagnosis of Eosinophilic esophagitis

2. Patients being treated with Topical (swallowed) steroids for Eosinophilic esophagitis
Primary End points

Incidence of Osteoporosis/Osteopenia diagnosed with DEXA scan in patients being treated with Topical (swallowed) steroids.
Study Design

• Retrospective chart Analysis of 51 patients with biopsy proven Eosinophilic Esophagitis.

• All patients were on topical (swallowed) steroids.

• 19 patients had their DEXA scan done.
Methods

• We identified 51 patients with Eosinophilic esophagitis in our clinical practice.

• 19 patients had their DEXA scan done and were selected for study.

• Patients had significant variations in their demographics, duration of treatment, dose of medication, multiple medications and supplementation with vitamin D and calcium.
Methods

• Patients had age range from 4 years to 57 years, mean age was 17.8 years.

• 12 patients were male and 7 female.

• Abdominal pain and food impaction were two most common presenting symptoms.

• GERD, asthma and IBD were common co-morbidities.
Methods

- All patients were treated with fluticasone during the course of illness.

- Dose of fluticasone varied from 176mcg/day to 880mcg/day.

- Most frequently used dose was 880mcg/day, which was also the maximum dose used.

- 15(79%) were treated with the maximum dose. 2(10.5%) patients were on 440mcg/day and other two were on 176mcg/day of fluticasone.
Methods

• Duration of treatment varied from 1 month to 72 months with mean duration of 25.7 months, standard deviation of 18.1 months and median of 24 months.

• Out of 19 patients 8 (42%) were on budesonide.

• 5 patients (26%) were started on it because of failure to respond to fluticasone. 1 patient was on budesonide for asthma and other one was on it for short period of time by other gastroenterologist. 1 patient had budesonide (Entocort) course for IBD in the past.
Methods

• Bone Mineral Density was measured with DEXA scan.

• Patients with Z-score or T-score of 0 to -1.0 were considered to have normal BMD.

• Patients with Z-score or T-score of -1.0 to -2.5 were considered osteopenic.

• Patients with scores less than -2.5 were considered osteoporotic.
Results

• Out of 19 patients, 16 (84%) had normal bone mineral density for their age matched on DEXA scan.

• 2 patients (11%) had osteopenia and one (5.3%) of them had osteoporosis.

• 16 (84%) patients with normal BMD were treated with topical (swallowed) steroids, with mean duration of treatment 24 months and median of 24 months.
Results

• Duration of treatment in abnormal DEXA scan group varied from 6 months to 72 months, with mean duration of 34 months.

• When duration of treatment was compare between normal and abnormal group P-value was 0.695567, which was not statistically significant.

• Dose of fluticasone varied from 176mcg/day to 880mcg/day in normal DEXA scan group.

• All three patients with abnormal DEXA scan were on 880mcg/day of fluticasone.
## Sex Distribution

<table>
<thead>
<tr>
<th>Sex</th>
<th>Normal</th>
<th>Osteoporosis/Osteopenia</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>9</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>3</td>
<td>19</td>
</tr>
</tbody>
</table>
## Correlation Between Fluticasone Dosage and Osteoporosis/Osteopenia

<table>
<thead>
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<th>Dose</th>
<th>Normal</th>
<th>Osteopenia/Osteoporosis</th>
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</thead>
<tbody>
<tr>
<td>176mcg/day</td>
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<td>2</td>
</tr>
<tr>
<td>440mcg/day</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>880mcg/day</td>
<td>12</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td></td>
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<td>3</td>
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## Frequency Of Budesonide Therapy

<table>
<thead>
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<th>Normal</th>
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<tbody>
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<td>2</td>
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</tr>
<tr>
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<td>6</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>3</td>
<td>19</td>
</tr>
</tbody>
</table>
Duration of Treatment in Months

- All
- Normal
- Osteopenia

Duration of Treatment in Months
Discussion

Patient 1

- One patient with osteopenia was on fluticasone at maximum dose for 6 months and was taking anti-seizure medications for many years.

- He had history of absence seizures and was treated with high dose valproic acid upto 2000mg/day for last few years.

- Valproic acid monotherapy has been associated with osteopenia if used more than one year.

The effect of valproate on bone mineral density in adult epileptic patients.
Patient 2

- Other patient with osteopenia was on oral prednisone for uncontrolled Crohn’s disease.

- He was a 12 year old male who had history of chronic abdominal pain for almost 1 year with anemia and growth failure.

- GI work up showed active Crohn’s disease and eosinophilic esophagitis.

- He was started on prednisone at 40mg daily for active Crohn’s disease.
Discussion

Patient 3

- Patient with osteoporosis had Celiac disease and he was also on oral prednisone for his uncontrolled symptoms of eosinophilic esophagitis.

- All three patients with osteopenia and osteoporosis were started on Vitamin D and calcium supplementation.
Discussion

- Glucocorticoids increase bone resorption and decrease bone formation.

- Bone loss is more pronounced in first few month of use and after that there is steady decline with continuous use.

- Studies on inhaled corticosteroids have NOT found consistent results on risk of osteoporosis.

- Some studies have suggested increase risk of fracture with long-term use of inhaled corticosteroids.

- There is no study mentioning the effect of topical (swallowed) steroids on bone health.

In our study, patients treated with topical (swallowed) steroids did not have any significant effect on bone health with a mean duration of treatment about 24 months. Patients who developed osteopenia or osteoporosis had additional risk factors including oral glucocorticoids and anti-seizure medications.
Conclusion

- Patients with eosinophilic esophagitis can be safely treated with topical (swallowed) steroids.

- In the absence of additional risk factors, there is no significant effect on bone Health.
Thank You