Prevalence of adrenal incidentaloma
a methodologic comparison of EMR query strategies

Michio Taya, BA¹; Viktoriya Paroder, MD, PhD²;
Eran Bellin, MD³,⁴; Linda Haramati, MD, MS²,³

²Departments of Radiology, ³Medicine, ⁴Epidemiology and Population Health,
¹Albert Einstein College of Medicine, Montefiore Medical Center, Bronx, NY
Disclosures

• Michio Taya  Nothing to disclose
• Viktoriya Paroder  Nothing to disclose
• Eran Bellin  Nothing to disclose
• Linda Haramati  Spouse, board member, Kryon Systems Ltd
Background

- Adrenal “incidentalomas” are adrenal nodules ≥1cm detected incidentally on radiologic examination of the abdomen for non-adrenal and non-malignancy related indications

- Radiologic prevalence of 4.4%¹

- Often are of uncertain clinical significance

Rationale & Objective

- Methods of ascertaining prevalence vary between studies, with one recent study reporting a prevalence of 0.6% when identifying cases by documented diagnosis in the EMR\(^1\)

- **Study Purpose:** To compare methods of ascertaining prevalence of adrenal incidentaloma

---

Methods

• Retrospective electronic medical record study using Looking Glass™ Clinical Analytics, (Streamline Health, Atlanta, GA) at Montefiore Medical Center

• All patients with CT or MR imaging of the abdomen between 1997 and 2014 were identified

• Patients with a documented diagnosis (ICD-9 code or problem list) for any history of adrenal disease were excluded
Methods

• Prevalence of adrenal incidentaloma was ascertained by two different detection strategies:
  1. **Documented Diagnosis** of adrenal incidentaloma
  2. **Imaging Reports** containing in the same sentence “adrenal” and “nodule,” “adenoma,” or “mass” and not containing “no” and ”adrenal” in the same sentence.

• Adrenal pathology surprise was further established in the second approach by excluding patients with past adrenal lab testing (cortisol, aldosterone, catecholamines, ACTH, renin) or having been registered in the cancer registry for any cancer excluding superficial skin cancers.
Results

Table 1. Adrenal Disease*

<table>
<thead>
<tr>
<th>ICD-9 Codes (n = 944)</th>
</tr>
</thead>
<tbody>
<tr>
<td>194.0 Malignant neoplasm adrenal</td>
</tr>
<tr>
<td>198.7 Secondary malignant neoplasm adrenal</td>
</tr>
<tr>
<td>227.0 Benign neoplasm adrenal#</td>
</tr>
<tr>
<td>237.2 Neoplasm uncertain behavior adrenal</td>
</tr>
<tr>
<td>255.0 Cushing syndrome</td>
</tr>
<tr>
<td>255.1 Hyperaldosteronism</td>
</tr>
<tr>
<td>255.2 Congenital adrenal hyperplasia</td>
</tr>
<tr>
<td>255.3 Other corticoadrenal overactivity</td>
</tr>
<tr>
<td>255.4-5 Adrenal insufficiency</td>
</tr>
<tr>
<td>255.6 Pheochromocytoma/paraganglioma</td>
</tr>
<tr>
<td>255.8 Adrenal disorder not elsewhere classified#</td>
</tr>
<tr>
<td>255.9 Adrenal disorder not otherwise specified#</td>
</tr>
</tbody>
</table>

Problem List Categories (n = 158)

- Adrenal nodule*
- Adrenal adenoma#
- Adrenal mass#
- Adrenal neoplasm
- Adrenal insufficiency
- Hyperaldosteronism
- Malignant adrenal neoplasm
- Metastatic cancer of adrenal glands
- Other adrenal disease

*All entries represent exclusion criteria. Those marked with # also used for detection criteria.

*Compare with n = 1,346; 0.6% in Figure 1 of Lopez D, Ann Intern Med 2016;165(8):533-542.
Results

• 194,624 individuals were identified in our initial search, from which 1,056 were excluded for past adrenal disease.

• Detection by the documented diagnosis method yielded 1,578 cases (0.8%), compared with 13,697 cases (7.1%) by the imaging report method.

• Further restricting detection to true “Adrenal Surprise” by excluding those with any past adrenal lab testing and cancer history yielded 10,568 cases (6.1%).

• Validation studies for the 7.1% prevalence with 100 records revealed an adrenal incidentaloma positive predictive value (PPV) of 98%. When restricted to size ≥1cm the PPV was 84%.
Conclusions

• Comparing our first strategy using documented diagnoses as criterion for incidentaloma as used in a recent study by Lopez we found a prevalence of 0.8% in our population similar to her 0.6%. However, when searching at the level of radiology report text, we found a prevalence ten-fold greater at 7.1%

• Therefore, adrenal incidentaloma are more robustly identified by searching radiologic reports

Acknowledgements

- This study was supported by the National Institutes of Health Clinical and Translational Science Awards Grant Number 1UL-1TR001073 from the National Center for Advancing Translational Sciences.