Using Big Data to Shift from Evidence-based Practice to Practice-based Evidence

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Evidence-Based Medicine in the EMR Era

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Many physicians take great pride in the practice approach, using the data captured

Results of Electronic Search of Patient Medical Records (for a Cohort of 98 Pediatric Patients with Lupus) Focused on Risk Factors for Thrombosis Relevant to Our 13-Year-Old Patient with Systemic Lupus Erythematosus.*

<table>
<thead>
<tr>
<th>Outcome or Risk Factor</th>
<th>Keywords Used to Conduct Expedited Electronic Search</th>
<th>Prevalence of Thrombosis no./total no. (%)</th>
<th>Relative Risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome — thrombosis</td>
<td>“Thrombus,” “Thrombosis,” “Blood clot”</td>
<td>10/98 (10)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Thrombosis risk factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy proteinuria (&gt;2.5 g per deciliter) Present at any time</td>
<td>“Nephrosis,” “Nephrotic,” “Proteinuria”</td>
<td>8/36 (22)</td>
<td>7.8 (1.7–50)</td>
</tr>
<tr>
<td>Present &gt;60 days</td>
<td>“Urine protein”</td>
<td>7/23 (30)</td>
<td>14.7 (3.3–96)</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>“Pancreatitis,” “Lipase”</td>
<td>5/8 (63)</td>
<td>11.8 (3.8–27)</td>
</tr>
<tr>
<td>Antiphospholipid antibodies</td>
<td>“Aspirin”</td>
<td>6/51 (12)</td>
<td>1.0 (0.3–3.7)</td>
</tr>
</tbody>
</table>

*In all cases, the sentences surrounding the keywords were manually reviewed to determine their relevance to our patient. Pancreatitis was defined as an elevated lipase level (twice the upper limit of normal) coexisting with abdominal pain. We used the word “aspirin” as a proxy for antiphospholipid antibodies, since it is standard practice at our institution to give all patients with these antibodies aspirin; if “aspirin” was found in the chart, than antiphospholipid-antibody status was confirmed by investigating the laboratory results.

We recently found ourselves in such a situation as we admitted to our service a 13-year-old girl so to speak — was equally fruitless and failed to produce a consensus. Of the 98 patients in our pediatric lupus cohort, 10 patients developed thrombosis, documented

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BOX 4-2
Gleaning Real-Time Insights from Clinical Data

While there has been an increase in the clinical knowledge being produced (see Chapter 2), the necessary evidence is lacking in many areas. However, the increased use of electronic medical records provides an opportunity to expand the evidence base on which clinicians can draw, especially in the absence of published data. For example, a group of pediatricians was treating a 13-year-old girl with systemic lupus erythematosus (SLE). Her autoimmune disease was complicated by conditions that put her at risk for blood clots, and her physicians considered the administration of an anticoagulant as a preventive measure. However, the physicians could not find any evidence (either peer-reviewed literature or expert opinion) pertaining to the patient’s situation. Given the need to make a decision quickly, they reviewed the medical records from their institution, collating the records of 98 other pediatric SLE cases handled by their division in the past 5 years. Based on these data, they conducted a cohort review and ascertained that children with similar complicating conditions had been more likely to develop blood clots. They then recommended anticoagulant use within 24 hours of the patient’s admission. The patient did not develop blood clots or experience any anticoagulant-related complications. While this form of data review does not eliminate more extensive clinical research protocols, the data in the electronic medical records allowed a real-time clinical decision to be made based on the best available data, an approach that holds promise for larger-scale use.

SOURCE: Frankovich et al., 2011.
An Ethics Framework for a Learning Health Care System: A Departure from Traditional Research Ethics and Clinical Ethics

BY RUTH R. FADE, NANCY E. KASS, STEVEN N. GOODMAN, PETER PRONOVOST, SEAN TUNIS, AND TOM L. BEAUCHAMP
How do we ensure that the healthcare system learns from every patient, at every visit, every time?
“We make a living by what we get, we make a life by what we give.”
-Winston Churchill

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Upon this gifted age, in its dark hour,
Rains from the sky a meteoric shower
Of facts...they lie unquestioned, uncombined.
Wisdom enough to leech us of our ill
Is daily spun, but there exists no loom
To weave it into fabric...

Edna St. Vincent Millay, Upon this age, that never speaks its mind.
In: Collected Sonnets.