Correlation of Workload With Disagreement and Amendment Rates in Surgical Pathology and Nongynecologic Cytology

Andrew A. Renshaw, MD, and Edwin W. Gould, MD

Key Words: Anatomic pathology; Surgical pathology; Cytopathology; Workload; Error rates; Amendments; Disagreement rates; Accuracy; Diagnosis; Second opinion; Sensitivity; Quality assurance; Continuous quality improvement

Abstract

In gynecologic cytology, workload limits are imposed as a surrogate to limit error rates. Whether workload correlates with error rates in surgical pathology and nongynecologic cytology is not known. We reviewed and compared the disagreement and amendment rates based on blinded review for 5 pathologists with the number of cases reviewed during that same period.

A total of 2,659 general surgical pathology and nongynecologic cytology cases underwent blinded review. There were 105 disagreements identified and 28 amendments issued. Workload varied from 455 to 649 cases per month. Neither the disagreement nor the amendment rate correlated with total workload during the period of the study (Pearson rank correlation \( r = 0.58 \) and 0.12, respectively).

There is no correlation between workload and disagreement or amendment rates. Workload seems to be a poor surrogate for error rates in the range of workloads examined in this study. Such data suggest that workload limits would have no effect at limiting or reducing error rates in surgical pathology or nongynecologic cytology.

Diagnostic accuracy is crucial in anatomic pathology, including surgical pathology and cytopathology, and remains a subject of considerable research interest. As a portion of the Clinical Laboratory Improvement Amendments of 1988, the workload of cytologists who screen cytology slides is strictly regulated, presumably in an effort to limit error rates. This regulation occurred despite the fact that there are few data on workload and error rates in gynecologic cytology, with the exception of the limited data available in the package insert for the recently approved FocalPoint (Cytyc, Boxborough, MA) screening device. At present, there are no workload limits in surgical pathology or for interpreting previously screened cytology slides. Data correlating workload and error rates in surgical pathology and nongynecologic cytology are extremely limited. It is not known whether workload limits would have any impact on the overall error rate. To address this, we correlated the workload of 5 pathologists with the rate of disagreement and amendment rates identified by blinded review of a portion of their general surgical pathology material.

Materials and Methods

The results of blinded review of material at the Baptist Hospital of Miami, Miami, FL, for the period October 2003 through June 2005 were reviewed.

The method of blinded review has been described. In brief, cases were reviewed after being signed out but without knowledge of the original diagnosis or history. If a disagreement was identified that might be of clinical significance, the case was reviewed with the original pathologist. Original
pathologists issued an amendment only if they thought such an action was warranted. If there was continued disagreement concerning a case, the case was sent to an outside consultant, and the consultant’s diagnosis was considered the “gold standard.”

Total workloads of the pathologists in the study were identified and included total number of surgical pathology and nongynecologic cytology cases signed out during the same period.

Statistical analysis was done using a 2-tailed χ² test. A P value of .05 or less was considered significant. Linear correlations were performed using a Pearson linear regression.

Results

A total of 2,659 cases originally diagnosed by 5 pathologists underwent blinded review Table 1. A total of 105 disagreements and 28 amendments were identified Table 2. The number of cases reviewed was strongly correlated with the number of slides reviewed (r = 0.96; P = .004). With the exception of pathologist 4, there was no significant difference in the distribution of cases in the categories listed in Table 1 (χ² > 1.0 for all). Pathologist 4 had a significantly higher percentage of gynecologic specimens than any other pathologist (P = < .001; χ²). Overall, there was no correlation of the disagreement or amendment rate with the years of practice in surgical pathology (r² = 0.23 and 0.18; P = .33 and .55, respectively).

Workload varied from 455 to 649 cases per month. Neither the disagreement nor the amendment rate correlated with total workload during the period of the study (Pearson rank correlation, r² = 0.58 and 0.12; P = .58 and .57, respectively). These results did not change when pathologist 4 was excluded (r² = 0.17 and 0.03; P = .58 and .80, respectively).

Discussion

The purpose of the study was simple—we sought to determine whether the disagreement rate or amendment rate generated by blinded review of surgical pathology and nongynecologic cytology material correlated with workload. To date, there is little information concerning workload and error rates in surgical pathology. Our results are also straightforward. We attempted to define a group of cases for review that was similar for all pathologists. There was a strong correlation between the number of cases reviewed and the number of slides reviewed, suggesting that the average number of slides per case was similar for all pathologists. In addition, for all but 1 pathologist, there was no significant difference in the distribution of cases that were reviewed by tissue type. Despite these controls, in the range of workloads in the study, there was no correlation at all with the disagreement or amendment rate.

However, there are limitations to the present study. First, only 5 pathologists, all from the same group, were included in the study. Obviously, if more pathologists from different groups were included, the results may be different. Second, the range of cases is relatively similar for all pathologists. It is possible that workload does affect error rate, but only at workloads significantly higher than those studied here. Third, although we tried to show that the cases that were reviewed by these pathologists were similar, it would be ideal if one could more fully control the case mix of each pathologist so that each pathologist examines exactly the same number and types of cases. However, such control is not possible in our real-life practice.

In the present study, the disagreement and amendment rates are used as surrogates for error. At present, there is no consensus about how to identify or define an error in surgical pathology. We believe that the disagreement rates we document are very close to the true error rate in the

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Cases Reviewed</th>
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<tbody>
<tr>
<td>Site</td>
<td>No. of Cases</td>
</tr>
<tr>
<td>Skin</td>
<td>89</td>
</tr>
<tr>
<td>Gynecologic</td>
<td>1,578</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>571</td>
</tr>
<tr>
<td>Nongynecologic cytology</td>
<td>126</td>
</tr>
<tr>
<td>Other</td>
<td>295</td>
</tr>
<tr>
<td>Total</td>
<td>2,659</td>
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<table>
<thead>
<tr>
<th>Table 2</th>
<th>Disagreements and Amendments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathologist No.</td>
<td>Workload (Cases/mo)</td>
</tr>
<tr>
<td>1</td>
<td>577</td>
</tr>
<tr>
<td>2</td>
<td>649</td>
</tr>
<tr>
<td>3</td>
<td>486</td>
</tr>
<tr>
<td>4</td>
<td>455</td>
</tr>
<tr>
<td>5</td>
<td>522</td>
</tr>
</tbody>
</table>
study. These are cases in which the original pathologist, or, if need be, an outside consultant, also agrees that the original diagnosis is worthy of changing. Our data suggest that this amendment rate can vary widely among pathologists.

However, there seems to be no correlation between this variation in amendment rate and the workload of the pathologists during the same period. This strongly suggests that, at least for the workload range of this study, workload is not a good surrogate for error rates and that efforts to limit or regulate the workload in surgical pathology within this workload range would be ineffective at limiting errors and an inappropriate regulatory choice.

There is no correlation between workload and disagreement or amendment rates. Workload seems to be a poor surrogate for error rates in the range of workload examined in the present study. Such data suggest that workload limits would have no effect at limiting or reducing error rates in surgical pathology or nongynecologic cytology.

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References