Improvement in the Routine Screening of Cervical Smears

A Study Using Rapid Prescreening and 100% Rapid Review as Internal Quality Control Methods

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Background: High rates of false-negative results constitute a routine problem in cytology laboratories. Of currently available internal quality control methods, 10% random review is the least effective in detecting false-negatives in routine screening. There is evidence that 100% rapid review and rapid prescreening perform well for this purpose. This study compared the performance of rapid prescreening and 100% rapid review as internal quality control methods for cervical cytology exams. Methods: Over 27 months, 12,208 cervical cytology smears were submitted to rapid prescreening and routine screening. The 100% rapid review method was performed on all smears classified as negative or unsatisfactory at routine screening. Conflicting results obtained with either method were reviewed in detail to define final diagnosis, which was considered the gold standard for evaluating the performance of rapid prescreening and 100% rapid review. Results: Compared with final diagnosis, the sensitivity of routine screening and rapid prescreening was 72.9% and 75.6%, respectively. Considering only smears classified as negative or unsatisfactory at routine screening, the sensitivity of rapid prescreening and 100% rapid review was 90.2% and 57.0%, respectively. Of 244 cases (2.0%) of false-negative results at routine screening, rapid prescreening identified 220 cases (1.8%), whereas 100% rapid review identified 140 (1.15%). Rapid prescreening detected all cases of HSIL identified as false-negatives. Conclusions: Rapid prescreening is more effective than 100% rapid review for the detection of false-negatives at routine screening, thus providing subsidies for the performance of cervical cytology, the principal function of which is to detect precursor lesions of cervical cancer. Cancer (Cancer Cytopathol) 2011;119:367–76. © 2011 American Cancer Society.

KEY WORDS: rapid prescreening, routine screening, rapid review, sensitivity, improvement, quality control, gynecological cytology.

Cervical cytology is a safe, effective method of detecting cervical cancer and its precursor lesions. In developed countries, where programs are well structured and this method is used to screen for these lesions, a significant reduction has occurred in the mortality and morbidity rates associated with this disease.1

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Nevertheless, mortality rates continue to be high in many developing countries, and variations in incidence rates occur because of ineffective screening programs that hamper women’s access to testing and to exams in which the quality is not always optimal. Consequently, ever since Papanicolaou first showed that cervical cancer could be detected at a preinvasive phase by analyzing cells removed from the cervix, numerous investigators have attempted to develop methods that would make this tool more effective in preventing this type of cancer.

Over many years, numerous debates have taken place in attempts to identify the optimal method of internal quality control for cervical cytology. Without doubt, the most rigorous method of avoiding screening errors and consequently monitoring the quality of routine cytology in laboratories is the repeat screening of all smears defined as negative in routine screening. Unfortunately, there are many problems associated with this method, including the time required to screen all negative smears in duplicate.

Reviewing smears defined as negative at routine screening is the most common approach used to detect false-negative results. The methods used include retrospective review, the review of cases based on clinical risk criteria, and the 10% random review of negative smears. Other methods also used as forms of internal quality control aimed at reducing the impact of high rates of false-negative results are the rapid screening techniques, that is, the rapid review of all negative smears and, more recently, the rapid prescreening of all smears.

The 10% random review method was initially introduced by the International Academy of Cytology in 1970 and is an obligatory internal quality control method used in cytology exams in the United States, as defined in the Clinical Laboratory Improvement Amendments. Nevertheless, this method has received much criticism because it detects few cases of false-negatives. The review of cases based on clinical risk criteria has also been reported to have produced poor results in various studies.

A rapid review method was initially described as a possible substitute to routine screening; however, it never came into use. In fact, the method most commonly used is the 100% rapid review of negative and unsatisfactory smears, which is currently the internal quality control method of choice in the United Kingdom. The 100% rapid review method was originally described by Baker and Melcher, who showed that it was possible to detect abnormal smears in only 30-60 seconds. Nevertheless, the objective of developing this specific method was not that it should substitute routine screening or even to suggest that the latter should be performed in less time.

The 100% rapid review method was compared with 10% random review for the first time by Faraker, who performed 100% rapid review in 30 seconds and reported a significant improvement in identifying false-negatives. Since then, many studies have shown the advantage of this method over the traditional 10% random review method for the identification of cases not identified in routine screening. Nevertheless, one of the criticisms of the technique is that it permits only partial evaluation of the rapid reviewer’s performance because only smears defined as negative in routine screening are revised; therefore, it is impossible for 100% rapid review to detect any abnormal cases that were not identified at routine screening.

Rapid prescreening permits the sensitivity not only of routine screening but also of rapid prescreening itself to be calculated. This is possible because all prescreened smears will be evaluated later at routine screening. As shown in various studies, it is possible to use abnormal cases identified both by rapid prescreening and by routine screening to monitor the performance of professionals in the daily routine of cytology laboratories. Nevertheless, it is only in Canada and the United Kingdom that this method is being routinely used. Finally, the high rates of false-negatives constitute one of the principal problems faced by cytology laboratories. Of the internal quality control methods currently available, 10% random review is the least effective for detecting false-negative results at routine screening. Nevertheless, despite evidence that 100% rapid review and rapid prescreening are effective for the detection of these false-negatives, further studies are necessary to compare the efficacy of these methods. Therefore, the objective of the present study was to compare the performance of rapid prescreening and 100% rapid review as internal quality control methods for cervical cytology exams.

MATERIALS AND METHODS
This study was conducted at the Rômulo Rocha Center for Clinical Analyses at the School of Pharmacy, Federal
University of Goiás, Goiânia, Goiás, Brazil, and was approved by the internal review board of this institution; in addition, informed consent was obtained from all women who agreed to participate in the study. Conventional cervical smears were collected at basic health care clinics in the municipality of Goiânia between March 2006 and May 2008. A total of 12,208 cytology exams were performed.

Two cytologists, one with 3 years of experience and the other with 14 years of experience, participated in this study and were responsible for performing routine screening. An additional 2 cytologists with 7 years of experience were responsible for performing rapid prescreening and 100% rapid review, alternating monthly between these 2 functions. Another 2 cytologists, one with 14 years and the other with 16 years of experience, were responsible for the detailed review of slides identified as abnormal at routine screening and also of any suspect slides identified by the internal quality control methods. These cytologists were also responsible for the review of any discordant cases to enable a final diagnosis to be reached.

No training was given to the reviewers prior to performing the 100% rapid review technique because this is the internal quality control method currently used in the laboratory. However, the cytologists had no experience in performing rapid prescreening, and despite being familiar with the 100% rapid review method, which is also based on the technique of rapid review, it was understood that training was required prior to performing rapid prescreening. Training was given in the form of a pilot study conducted over a 3-month period, during which the cytologists had the opportunity to practice and standardize the 2 methods and to define the operational features of the study in such a way as to ensure that all the requirements and procedures established in the methodology were fulfilled.

To avoid fatigue and any consequent lack of concentration during the study, the work of the prescreener and rapid reviewer was limited to 40 slides a day in rapid prescreening and 100% rapid review, with each slide examined for a mean of 1 minute as the first activity of the day.

The study procedures were conducted in the following sequence: all routine cytology slides were submitted to rapid prescreening and classified as suspect, negative, or unsatisfactory; the results were then recorded on a spreadsheet. The prescreener had no access to a woman’s clinical data and did not participate in routine screening or in

100% rapid review. Furthermore, no marks were made on the smears.

Following rapid prescreening, all the smears were submitted to routine screening. There was no time limit for this screening; however, the mean time for analysis of the smears was around 6-10 minutes. The cytologists responsible for routine screening were unaware of the findings at rapid prescreening.

Following routine screening, all the smears classified as abnormal were submitted to a detailed review, and the results were recorded on the spreadsheet, whereas the smears classified as negative or unsatisfactory in this analysis were submitted to 100% rapid review. The results of this review were classified as suspect, negative, or unsatisfactory and recorded on the spreadsheet.

All the smears defined as negative or unsatisfactory at routine screening that had discordant results in either of the internal quality control methods were registered on a spreadsheet for discordant results.

All the smears identified at routine screening or by either of the internal quality control methods as suspect, abnormal, or unsatisfactory were submitted to a detailed review, which was performed by 2 cytologists who had not participated in any of the previous steps. When the 2 cytologists issued concordant diagnoses, this was considered the final diagnosis. In this analysis, discordant results were analyzed in a consensus meeting to define the final diagnosis. When smears were identified as negative at rapid prescreening, routine screening, and 100% rapid review, this was considered the final diagnosis.

All the review steps were blinded except for the consensus meeting. The results were classified in accordance with the 2001 Bethesda System.27

The final diagnosis was considered to constitute the gold standard for the evaluation of the performance of rapid prescreening and 100% rapid review. Therefore, the smears identified as suspect at rapid prescreening or 100% rapid review and confirmed as abnormal in the final diagnosis were considered to represent false-negatives of routine screening.22

The false-negative rate of routine screening was defined as the number of abnormal smears unidentified at routine screening divided by the total number of smears and expressed as a percentage.

In the statistical analysis, the sensitivity and specificity of rapid prescreening, routine screening, and 100%
rapid review were calculated together with their respective 95% confidence intervals (95% CIs) and positive predictive values (PPVs) and negative predictive values (NPVs).

**RESULTS**

Rapid prescreening and routine screening were performed on a total of 12,208 smears (100%) received for analysis, and 100% rapid review was performed on 11,245 smears (92.11%) classified as negative or unsatisfactory at routine screening.

The final diagnoses, considered the gold standard for the evaluation of the performance of 100% rapid review and rapid prescreening, consisted of 11,078 negative smears (90.74%), 230 unsatisfactory smears (1.88%), and 900 abnormal smears (7.37%).

Compared with final diagnoses, the sensitivity of routine screening and rapid prescreening was 72.9% (95% CI, 70.0%-75.8%) and 75.6% (95% CI, 72.8%-78.4%), respectively, for abnormalities as severe as atypical squamous cells of undetermined significance (ASC-US) or worse.

Table 1 shows the performance of the internal quality control methods. For the purpose of analysis, only smears considered negative or unsatisfactory at routine screening were taken into consideration. In this analysis, the sensitivity of rapid prescreening and 100% rapid review was 90.2% and 57.0%, respectively, for abnormalities as severe as ASC-US or worse. When cytology results were stratified, sensitivity was found to be best with rapid prescreening compared with 100% rapid review for all abnormalities.

Table 2 shows the frequency of abnormal cytology results before and after performing internal quality control methods. Routine screening detected 656 (5.37%) of the 900 (7.37%) abnormal results confirmed in the final diagnosis. The greatest frequency of false-negative results was found with rapid prescreening (7.17%), which also successfully detected all the cases of atypical glandular cells (AGC) and high-grade squamous intraepithelial lesion (HSIL).

Table 3 shows the false-negative results identified by the internal quality control methods. Rapid prescreening detected the greatest number of false-negatives in all the categories of cytology results. Indeed, one third of false-negatives classified as HSIL in the final diagnosis were identified only by rapid prescreening.

Table 4 shows the number of hours required to introduce each method into the routine of a cytology laboratory. Rapid prescreening requires approximately 19% more time in the daily routine of a laboratory compared with 100% rapid review.

**DISCUSSION**

The present results show the performance of rapid prescreening to be better than that of 100% rapid review as a method of internal quality control in the routine screening of cervical smears. These findings confirm that rapid
Table 2. Frequency of Abnormal Cervical Cytology Results Before and After Internal Quality Control Methods

<table>
<thead>
<tr>
<th>Cytology Results</th>
<th>Routine Screening</th>
<th>Routine Screening and Rapid Prescreening</th>
<th>Routine Screening and 100% Rapid Review</th>
<th>Final Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>ASC-US</td>
<td>172</td>
<td>1.41</td>
<td>264</td>
<td>2.16</td>
</tr>
<tr>
<td>ASC-H</td>
<td>84</td>
<td>0.69</td>
<td>115</td>
<td>0.94</td>
</tr>
<tr>
<td>LSIL</td>
<td>221</td>
<td>1.81</td>
<td>297</td>
<td>2.43</td>
</tr>
<tr>
<td>HSIL</td>
<td>158</td>
<td>1.29</td>
<td>176</td>
<td>1.44</td>
</tr>
<tr>
<td>AGC</td>
<td>21</td>
<td>0.17</td>
<td>24</td>
<td>0.20</td>
</tr>
<tr>
<td>ASC-US +</td>
<td>656</td>
<td>5.37</td>
<td>876</td>
<td>7.17</td>
</tr>
</tbody>
</table>

Nota bene: the percentage of abnormal cervical cytology results was based on the total number of smears analyzed.

ASC-US, atypical squamous cells of undetermined significance; ASC-H, atypical squamous cells, cannot exclude high-grade squamous intraepithelial lesion; LSIL, low-grade squamous intraepithelial lesion; HSIL, high-grade squamous intraepithelial lesion; AGC, atypical glandular cells; ASC-US +, ASC-US or worse.

Table 3. Frequency of False-Negative Cervical Cytology Results Identified by the Methods of Rapid Prescreening and 100% Rapid Review

<table>
<thead>
<tr>
<th>Cytology Results</th>
<th>Rapid Prescreening</th>
<th>100% Rapid Review</th>
<th>Detected Only by Rapid Prescreening</th>
<th>Detected Only by 100% Rapid Review</th>
<th>Total Number of False-Negative Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>ASC-US</td>
<td>92</td>
<td>0.75</td>
<td>54</td>
<td>0.44</td>
<td>52</td>
</tr>
<tr>
<td>ASC-H</td>
<td>31</td>
<td>0.25</td>
<td>18</td>
<td>0.15</td>
<td>19</td>
</tr>
<tr>
<td>LSIL</td>
<td>76</td>
<td>0.62</td>
<td>54</td>
<td>0.44</td>
<td>27</td>
</tr>
<tr>
<td>HSIL</td>
<td>18</td>
<td>0.15</td>
<td>12</td>
<td>0.10</td>
<td>6</td>
</tr>
<tr>
<td>AGC</td>
<td>3</td>
<td>0.03</td>
<td>2</td>
<td>0.02</td>
<td>1</td>
</tr>
<tr>
<td>ASC-US +</td>
<td>220</td>
<td>1.80</td>
<td>140</td>
<td>1.15</td>
<td>105</td>
</tr>
</tbody>
</table>

Nota bene: the percentage of abnormal false-negative cervical cytology was based on the total number of smears analyzed.

ASC-US, atypical squamous cells of undetermined significance; ASC-H, atypical squamous cells, cannot exclude high-grade squamous intraepithelial lesion; LSIL, low-grade squamous intraepithelial lesion; HSIL, high-grade squamous intraepithelial lesion; AGC, atypical glandular cells; ASC-US +, ASC-US or worse.

Table 4. Differences in Workload Between the 2 Internal Quality Control Methods Analyzed

<table>
<thead>
<tr>
<th>Measure</th>
<th>Rapid Prescreening</th>
<th>100% Rapid Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of smears rapidly screened</td>
<td>12,208</td>
<td>11,245</td>
</tr>
<tr>
<td>Number of suspect smears</td>
<td>481</td>
<td>236</td>
</tr>
<tr>
<td>Number of suspect smears confirmed as positive in final diagnosis</td>
<td>220</td>
<td>140</td>
</tr>
<tr>
<td>Number of smears reviewed for each false-negative result identified</td>
<td>55.49</td>
<td>80.32</td>
</tr>
<tr>
<td>Hours used for rapid screening</td>
<td>203.47</td>
<td>187.42</td>
</tr>
<tr>
<td>Hours used for detailed review</td>
<td>48.10</td>
<td>23.60</td>
</tr>
<tr>
<td>Hours used for internal quality control</td>
<td>251.57</td>
<td>211.02</td>
</tr>
</tbody>
</table>
prescreening is in fact an effective method for evaluating and monitoring the quality of cervical cytology exams.

The sensitivity of rapid prescreening was approximately 60% higher than that of 100% rapid review in detecting abnormalities as severe as ASC-US or worse, and although no other studies have yet been carried out to compare these methods, these findings are in agreement with other studies that have evaluated rapid prescreening and 100% rapid review separately.\(^4,9,19,20,28-32\)

Significant improvement in sensitivity was found in routine screening following implementation of rapid prescreening and 100% rapid review as methods of internal quality control. Sensitivity increased 24% and 15% for rapid prescreening and 100% rapid review, respectively, in detecting abnormalities as severe as ASC-US or worse. Other studies have also reported improvement in the sensitivity of the exam when rapid prescreening was used as an internal quality control.\(^4,7,24,29,33\)

Rates of false-negative results of 1.80% and 1.14% identified by rapid prescreening and 100% rapid review, respectively, were consistent with those reported from other studies, in which the rate of false-negative results ranged from 0.0% to 9.8% with rapid prescreening and from 1.07% to 33.1% with 100% rapid review.\(^9,15,20,28,34-38\)

What, then, would explain that one method is more sensitive than the other despite both methods using the same rapid-screening technique? Why was sensitivity higher in some studies evaluating the 100% rapid review method compared with others that evaluated the same technique? This may be because of the methodology of these studies, in which rapid screening was performed on a battery of smears for which the results were already known (normal or abnormal) as a tool to measure sensitivity with the 100% rapid review method. That the examiner was aware there were not only normal smears but also abnormal ones in that batch of smears may explain these findings, and this is precisely the benefit of rapid prescreening.\(^17,28,39-41\)

It is already known that the principal difference between rapid prescreening and 100% rapid review is that rapidly screening only those smears considered normal or unsatisfactory at routine screening means evaluating a group of smears in which the incidence of abnormality is low. This is a tedious task that may reduce concentration and result in screening errors. On the other hand, with rapid prescreening, the group of smears to be screened rapidly is composed of normal, abnormal, and unsatisfactory smears and is performed prior to routine screening, which makes the work more interesting. Another possible explanation for the better performance of rapid prescreening may lie in the finding that cytologists are more alert while performing rapid prescreening and routine screening because they are aware they are being evaluated daily.\(^17,20,42\)

A possible manner in which to improve the sensitivity of 100% rapid review would be to place abnormal slides in the routine. This was first suggested by Clark et al,\(^43\) who placed abnormal smears with various degrees of difficulty in the group of smears for 100% rapid review, and the reviewers stated that knowledge of this increased their state of alertness. Nonetheless, this routine may demand time and effort because it requires a person to perform this task daily without the reviewers knowing which slide is not part of the routine.

Few publications have evaluated the sensitivity of 100% rapid review, and of these, the majority evaluated the accuracy of the method, performing rapid screening prior to routine screening, that is, the smears were prescreened and not reviewed. With this methodology, 100% rapid review has shown better sensitivity, particularly in the detection of high-grade lesions.\(^17,39,40\) In the present study, the sequence of events was established in accordance with the principle of each method, that is, rapid prescreening was performed prior to routine screening, whereas 100% rapid review was performed afterward. Results showed that rapid prescreening performed best for the detection of HSIL, whereas 100% rapid review performed better in cases of low-grade squamous intraepithelial lesions. Other studies have also reported similar results.\(^22,31,43,44\)

Using the final diagnosis as the gold standard, it was possible to calculate the sensitivity of rapid prescreening and 100% rapid review for all abnormalities separately or as a group. The question then arises with respect to the optimal method for evaluating the performance of the team—by assessing the sensitivity of the method for the detection of all lesions or only for HSIL? The sensitivity of the methods (rapid prescreening and 100% rapid review) in identifying more severe lesions probably makes this the best choice for at least 2 reasons. First, sensitivity in detecting HSIL will not be affected if there is an increase in the number of borderline cases (ASC and/or AGC) because of an overestimation by the rapid prescreeners or
reviewers. And second, the cases of HSIL are the most significant in the progression and treatment of the disease; therefore, poor sensitivity in the detection of these lesions represents a significant problem that should be corrected immediately. In the present study, rapid prescreening proved better for the detection of HSIL compared with 100% rapid review.

Because 100% rapid review is performed after routine screening, many abnormal cases have already been removed, including those most easily detected such as smears with an abundance of abnormal cells and those with obvious criteria of malignancy. Many but not all the abnormal smears that failed to be identified at routine screening probably contain few abnormal cells or cells with few criteria indicative of malignancy. Hence, the sensitivity of rapid prescreening compared with 100% rapid review may be overestimated because the former includes both truly positive and false-negative results. Nevertheless, in the present study the sensitivity of rapid prescreening was calculated at 2 moments: when the truly positive and false-negative findings at routine screening were included in the analysis, the sensitivity of rapid prescreening was 75.6%, whereas when only the false-negatives were included in the analysis, the sensitivity of rapid prescreening was higher (90.2%), with that of 100% rapid review only 57.0%. These data suggest that other factors are associated with the greater sensitivity of rapid prescreening.

Rapid prescreening has at least 2 advantages when incorporated into the routine of a laboratory as internal quality control. First, by not marking the slides and referring them for routine screening, it is possible to use the cases identified as abnormal at rapid prescreening to calculate the sensitivity of both routine screening and rapid prescreening. It is for this same reason that it is impossible to use 100% rapid review to measure the sensitivity of routine screening because in this method only the negative cases are reviewed. Second, irrespective of the result of rapid prescreening, this method offers an advantage that 100% rapid review does not: if rapid prescreening fails, false-negative cases may still be picked up during routine screening because if the sensitivity of this method is not as good as expected, this will be evident, and it will be possible to calculate the exact extent of this shortcoming. With 100% rapid review, only the performance of the routine screener can be evaluated.

Nevertheless, there are disadvantages associated with rapid prescreening. It is known, for example, that rapid prescreening is more time consuming than 100% rapid review and demands significant change in the workflow of the laboratory. Moreover, because the slides are not marked, when a difference of opinion occurs with respect to a certain case, the prescreener has to reevaluate the slide in question and detect the cells that were initially identified during rapid prescreening. Another disadvantage is that there is no guarantee that the cytologist performs in the same way as a prescreener and routine screener. Another limitation of the methods of rapid screening (100% rapid review and rapid prescreening) that also apply to other review methods is that the performance of these methods is optimal when carried out by cytologists who did not participate in routine screening because any errors of interpretation would probably be repeated. Therefore, laboratories with only 1 cytologist will find difficulty in implementing these methods. Nevertheless, in these cases, strategies may be created such as performing the techniques on different days from those on which routine screening is carried out or even entering into an agreement with another laboratory to perform this task.

In addition to the limitation posed by the number of cytologists in the laboratory, other limitations may be minimized or even eliminated. The present study shows that rapid prescreening involves a 19% increase in the time spent at the task compared with 100% rapid review. If we take into account that rapid prescreening detected approximately 58% more false-negatives, 6 of which corresponded to cases of HSIL that had not been identified by 100% rapid review, this time is insignificant. Brooke et al also observed that rapid prescreening increased the time spent in performing internal quality control by 15% and detected a greater number of false-negatives when the results of their study were compared with the period in which 100% rapid review was used as internal quality control in the laboratory routine.

That the smear is returned to the prescreener to identify abnormalities that were not detected in the detailed review also functions as an exercise to improve cytology criteria because sometimes when reevaluating the smear, the reviewer perceives his/her error, thereby enabling a reduction in such cases over time. It also enables an evaluation of the laboratory, the team, and the individual by continuous monitoring of rapid prescreening and...
routine screening. Therefore, it allows evaluation of which member of the team performs each of these activities best and which needs continued education to improve the agreement of cytology results. Smith et al.\(^2\) compared 2 periods in which rapid prescreening was used and found that the majority of their prescreeners whose performance was poor at the first evaluation improved their sensitivity merely by knowing that their performance had been poorer than that of their colleagues. Dudding et al.\(^7\) reported that prescreeners were keenly aware of the importance and power of rapid prescreening and were willing to expend extra time in achieving the best result possible. Wilgenbusch et al.\(^3\) related that the added feedback associated with rapid prescreening is very important to ensure the quality of screening because it leads cyto-

In analyzing the results of this study, many hypotheses were raised about the factors associated with better performance of rapid prescreening compared with 100% rapid review. Nevertheless, these hypotheses were based on studies that evaluated the methods separately and that used different methodologies, which do not permit us to say with any certainty which are correct and which are not. Therefore, new studies should be conducted to compare the various factors involved in these 2 methods in order to clarify the various hypotheses made about the performance of each.

Nevertheless, despite all the unanswered hypotheses, there is a consensus that every screener commits errors. This is inevitable in the case of an exam as subjective as this one, hence prone to human failure. Unfortunately, these errors may cause harm to women who receive a false-negative result. Consequently, there is a risk of legal proceedings and a lack of credibility in the laboratory and in screening programs in general.\(^2\) Therefore, the false-negative rates for the laboratory and for each individual screener should be calculated at regular intervals to ensure that performance is kept within minimum acceptable limits. Finally, in accordance with the results of this study, this is possible if rapid prescreening is used as a method of internal quality control because this method has proven effective in detecting false-negatives from routine screening, constantly providing subsidies to improve the performance of cervical cytology exams, whose principal function is to detect precursory lesions of cervical cancer.

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**CONFLICT OF INTEREST DISCLOSURES**

The authors make no disclosures.

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