Influence of the News Media on Diagnostic Testing in the Emergency Department

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Objective: To examine the association between mass media attention regarding invasive group A streptococcal (GAS) disease and testing for GAS in a pediatric emergency department (ED).

Design, Setting, and Participants: An observational analysis was performed of patients who had GAS tests done in a pediatric ED between December 1, 1999, and November 30, 2001. Data were analyzed by dividing each of the 2 years into 4 consecutive 90-day intervals. Data including age, date of the visit, presenting complaint, primary discharge diagnosis, whether a GAS test was obtained, and the results were collected from an electronic data repository. The date of the news stories, the station, and the duration of the broadcast were collected from electronic archives of the local newspaper and a broadcast monitoring service.

Main Outcome Measure: The rate of GAS tests done per 1000 ED visits and the rate of positive tests per 1000 ED visits.

Results: An average of 103 GAS tests were performed per 1000 ED visits in the December through February period in year 2 compared with 55 GAS tests per 1000 ED visits in a similar period in year 1. This difference was statistically significant (difference, 48 tests; 95% confidence interval, 24-72 tests; \( P < .001 \)). There were no significant differences in the proportion of positive tests (32% in year 1 vs 20% in year 2; mean difference, −11%; 95% confidence interval, −23% to 1%; \( P = .07 \)). There were a total of 16 newspaper articles and 34 television stories on GAS during the 2-year study period. The peak in GAS tests and the peak in media events were concomitant.

Conclusion: A surge in news stories regarding GAS disease was associated with an increase in testing for GAS in a pediatric ED.


GROUP A streptococci (Streptococcus pyogenes) (GAS), commonly referred to in the lay press as “the flesh-eating bacteria,” causes a variety of illnesses in children ranging from a mild pharyngitis to less common but more severe invasive infections. Clinically, differentiation between viral and GAS pharyngitis is not always possible. Previous reports have shown that physicians tend to misdiagnose GAS as a cause of pharyngitis. One study showed only a 21% rate of agreement between physicians on the subjective probability estimates of a positive culture. To decrease this uncertainty, laboratory confirmation for the presence of GAS is recommended and usually accomplished by a rapid test for GAS.

There has been a resurgence of invasive GAS infections since 1987 in the form of streptococcal toxic shock syndrome, bacteremia, and necrotizing fasciitis. Such infections have been reported as occurring sporadically, with occasional identification of clusters. The skin or mucous membrane is believed to be the portal of entry in most cases. Invasive GAS disease rarely follows GAS pharyngitis. There are currently no recommendations and no scientific evidence to support performing a rapid test for GAS to prevent invasive GAS disease.

The influence of the mass media on behavior is well studied. Knowledge of these effects has been used successfully in the commercial sector. The public health community has taken advantage of the mass media to influence behavior in the areas of cancer screening and injury prevention. Mass media has the capacity to reach and influence millions of people simultaneously. While much is known about the influence of the media on consumer behavior, there are few reports of the in-
fluences the media on use of health services or physician behavior. In fact, we found one study quantifying the effect of the media on emergency department (ED) visits, but none on testing in the ED.

This study was undertaken to describe the impact of news coverage of a cluster of invasive GAS cases in the Kansas City, Mo, area on testing for GAS in a large urban referral pediatric emergency department (ED) located in a children’s hospital with an annual ED census of 55,000 visits. An observational analysis was performed to determine the association between the number of news media events and the number of rapid tests performed for GAS in a pediatric ED.

**METHODS**

This retrospective data analysis examined visits to the ED of an urban midwestern children’s hospital. This study was granted exempt status by the Pediatric Institutional Review Board of University of Missouri–Kansas City, as no patient identifiers were collected, patients were not contacted, and their care was not affected.

A database for the study was constructed from 3 data sources. The first data source was the central data repository at the hospital, where all patient encounter data are stored. All visits to the ED for a 2-year period from December 1, 1999, through November 30, 2001, were identified. Variables extracted from this data source included date of the visit, age of the patient, the presenting complaint, the primary discharge diagnosis, whether a rapid test for GAS was done, and the results of the test.

The second data source was the electronic archives of the dominant local newspaper. An electronic search was carried out for all published news stories mentioning GAS disease during the same study period. Specific search terms used were *streptococcus, group A beta streptococcus, toxic shock, and flesh-eating bacteria*. The date of each news story was noted. If multiple stories occurred on the same date, the number of stories on that day was noted.

The third data source was a commercial broadcast-monitoring service to which the hospital subscribes. This service provides a monthly broadcast list of all news stories on any local television station related to the hospital. Search terms used were *children’s mercy CMH*. Stories about GAS without these search terms were not included in the search. All summaries were printed and manually reviewed by one of us (V.S.) to include only stories relating to GAS. The date and time of the broadcast, the station that broadcasted it, and the duration of the broadcast story were extracted from this data source.

The study period was divided into two 12-month intervals: year 1 (December 1, 1999, through November 30, 2000) and year 2 (December 1, 2000, through November 30, 2001). This period was chosen because the start of year 2 coincided with the start of media attention. Data were analyzed by dividing each of the 2 years of the study period into 4 consecutive 90-day intervals, for a total of eight 90-day intervals. For each 90-day interval, the total number of ED visits and the number of those visits that included performance of a GAS rapid test were determined. For each period, the rate of GAS rapid tests per 1000 patient visits was calculated. The proportion of positive tests was also noted. The generalized least squares model was used to model numbers of children who were tested for GAS and the ratio of positive tests in the different periods during the 2 years. The generalized least-squares model was chosen over the linear model because it accounts for correlation among events in the model. This accounted for the lack of independence among individual observations and the underlying effect of the time trend.

Differences in the frequency of presenting complaints and primary discharge diagnosis during the December through February periods in year 1 and year 2 were tested by means of a 2-sided a-level of .05 using the Fisher exact test (SPSS for Windows, version 11; SPSS Inc, Chicago, Ill). The exact confidence intervals (CIs) for relative risk were computed with StatXact for Windows, version 3.0 (Cytel Software Corporation, Cambridge, Mass).

There were 40,171 ED visits in year 1 and 43,387 ED visits in year 2. A total of 2487 GAS tests were performed in year 1 (62/1000 ED visits) and 3439 were performed in year 2 (79/1000 ED visits) ($P=.001$). The average (±SD) age of children tested was 7.8±4.3 years in year 1 and 7.9±4.5 years in year 2, which was not statistically significant.

There were a total of 16 newspaper articles and 34 television stories on GAS during the study period. Forty-eight stories (96%) occurred in the December through February period of year 2. Television stories ran for a total duration of 42 minutes 14 seconds. Stories were carried on 4 major networks, with 17 (50%) of the stories carried by 1 network.

An average of 103 GAS tests were performed per 1000 ED visits in the December through February period in year 2 compared with 55 GAS tests per 1000 ED visits during a similar period in year 1. This difference was statistically significant (48 tests; 95% CI, 24-72 tests; $P<.001$). Comparisons of rates of tests during other intervals did not show statistically significant differences (Table).

For the 2-year period, the proportion of positive GAS tests was 22%. A comparison of like 90-day intervals for each year showed no significant differences in proportion of positive tests. However, differences between the

**RESULTS**

<table>
<thead>
<tr>
<th>Mean No. of GAS Tests</th>
<th>Year 1 (December 1, 1999–November 30, 2000)</th>
<th>Year 2 (December 1, 2000–November 30, 2001)</th>
<th>Difference in Means (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1–February 28 or 29</td>
<td>55</td>
<td>103</td>
<td>48 (24 to 72)</td>
</tr>
<tr>
<td>March 1–May 31</td>
<td>65</td>
<td>72</td>
<td>8 (-16 to 32)</td>
</tr>
<tr>
<td>June 1–August 31</td>
<td>59</td>
<td>73</td>
<td>15 (-9 to 39)</td>
</tr>
<tr>
<td>September 1–November 30</td>
<td>69</td>
<td>64</td>
<td>-5 (-29 to 19)</td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; ED, emergency department; GAS, group A streptococcal.
COMMENT

In this study we document an abrupt increase in rapid tests for GAS disease in a pediatric ED concomitant with a large number of news stories about GAS. Furthermore, the ratio of positive tests showed no change or a slight trend toward a decline during this time of media coverage, suggesting no increase in the prevalence of disease during this period of increased testing for GAS disease. There was no difference in the average age of the patients tested, suggesting that increased GAS testing was not limited to any particular age group. The results of this study are similar to those of previous studies and a systematic review, suggesting that the mass media, including both planned and unplanned coverage, can have an impact on health services utilization.

This observational study of the relationship between media events and GAS testing in the ED demonstrates a strong association; however, causation cannot be established. One possible explanation for the increase in the number of tests is seasonality, but a comparison of similar seasons during the study period made this explanation unlikely. A second explanation may be that the increase in the number of tests is associated with an increase in the number of ED visits. Previous studies have shown a steep increase in patient contacts after extensive media coverage of erectile dysfunction in Germany and a decline in ED utilization coinciding with the Super Bowl broadcast. We controlled for this by computing a rate of tests per 1000 ED visits. Other possible explanations include an epidemic of viral pharyngitis, or an increase in the presenting complaints of sore throat or fever as a reason for the increased testing. We found no increase in a discharge diagnosis of either “acute pharyngitis” or “viral infection.” We also found no statistically significant increase in the presenting complaint of “fever.” In fact, a presenting complaint of “sore throat” was statistically significantly decreased during the period of greater testing for GAS.

Other factors responsible for the increase could have included increased concern on the part of health care providers regarding aggressive GAS infection. Such concern could have arisen from other nonmedia sources of information, including that from the medical community through journals, the Internet, and an increase in local medical education (grand rounds, health department notices, and intrahospital notices) on the topic. Our retrospective study design did not examine this and other common public sources of medical information, including radio and the Internet, an important source of adult health information. Another limitation was that our commercial broadcast-monitoring search did not include any story about GAS that did not mention children’s mercy or CMH. This would only underestimate the number of stories on GAS and bias the study toward the null hypothesis. Since only 1 ED experience was examined, generalizability is limited, and we cannot discern whether there was a widespread increase in testing involving other EDs.

The increase in GAS testing is an indication of either an increased demand for the test by the patient or a heightened awareness or concern on the part of the health care provider. Determining whose behavior was changed and how it was changed is beyond the scope of this article. Previous investigators examined the effect of media coverage on the adverse effects of calcium channel blockers. They concluded that such coverage led to an “epidemic of anxiety” in a general internal medicine faculty group practice. Such anxiety could have been functioning in the present study, but whether the source of the anxiety was the practitioner or the patient is not known.

In conclusion, our study demonstrates an association between increased media coverage and testing for GAS in an ED. We were unable to demonstrate a concomitant increase in the prevalence of streptococcal or other acute pharyngitis or an increase in the frequency of patients presenting with a chief complaint of sore throat or fever. This increase may represent a change in physicians’ practices. Further studies to understand how the media influences patient and physician behaviors are needed. For EDs this is particularly crucial, as surges in health services demand can have the potential
The influence of the mass media on the public is well documented, but no data are available regarding its influence on testing in emergency departments. In this study we document an abrupt increase in rapid tests for GAS disease in a pediatric ED concomitant with a large number of news stories about invasive GAS disease, without evidence of an increase in the prevalence of disease during this period of increased testing. Further studies on how the media affects physician and patient behavior are needed, as this has implications for public health education and for resource utilization in EDs.

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REFERENCES


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