Student Rotation in a Veterinary Teaching Hospital as a Potential Surveillance Confounder

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OBJECTIVE

This paper reports on a potential confounder discovered during an investigation of microbiology orders in a veterinary teaching hospital as a possible data source for outbreak detection.

BACKGROUND

Identifying potential biases and confounders that may affect data quality is an important consideration when evaluating surveillance systems [1]. Having the benefit of predictable temporal trends is a key requirement to improve upon the specificity of detecting outbreaks [2]. Identification of factors that impact on the reliability of the temporal trends observed in the data may provide for the ability to improve the capability to identify aberrations in those trends.

During a retrospective study of a dataset of microbiology orders from the veterinary teaching hospital at The Ohio State University for 2003 we noticed regular intervals when increases in the number of culture orders were not accompanied by proportional increases in the number of isolates. These instances appeared to occur at intervals that coincided with the clinical rotation of senior veterinary students within the hospital.

METHODS

Microbiology ordering efficiency was established by determining the number of microbiology orders submitted during each calendar week that resulted in the growth of at least one microorganism for those weeks that students were in rotation during 2003 (weeks 3-50). We compared the instances when ordering efficiency was below the weekly average between the weeks that marked the beginning of a clinical rotation with weeks that did not mark the beginning of a clinical rotation by calculating the OR's by clinic and order type.

RESULTS

The order efficiency for all cultures was 5 times more likely to be below average during the first week of any clinical rotation compared to other weeks. Below average order efficiency of susceptibility cultures was associated with the first weeks of those clinics that included small animal and general practice (OR=14.29) while low order efficiency for blood cultures (OR=3.50) was associated with intensive care and necropsy.

		OR of <mean isolates:orders during 1st weeks compared to other rotation weeks (95% CI)		
Order	Mean weekly isolates:orders (range)	Any Clinic	Clinics I & II	Clinic III
All microbiology orders	0.66 (0.29-1)	5.20 (1.51,17.93)	12.80 (2.05,79.84)	3.38 (0.90,12.68)
Blood Culture	0.28 (0-1)	3.60 (0.64,20.33)	0.95 (0.13,7.23)	3.50 (0.55,22.11)
Mycology Culture	0.23 (0-1)	0.77 (0.18,3.29)	3.53 (0.41,30.47)	0.33 (0.07,1.52)
Susceptibility Culture	0.71 (0.29-1)	6.07 (1.75,21.03)	14.29 (2.33.87.49)	3.81 (1.02,14.28)

Table 1: Average weekly proportion of isolates to microbiology orders made during clinical rotations at The Ohio State University Veterinary Teaching Hospital in 2003 and the OR of the proportion of isolates to orders being less than average during the first weeks of rotation compared to any other weeks of rotation. Clinics I & II included small animal practice and surgery, dermatology, and general practice. Clinic III included emergency, intensive care, necropsy, and preventive medicine

CONCLUSIONS

These results suggest that the test ordering behavior of veterinary students may be influenced by their introduction into a new clinical experience. This is especially true for those rotations that include small animal medicine and dermatology. The goals and methods of instructors might also mediate test ordering behavior. Test ordering from an ever and frequently changing group of providers, as in a teaching environment, may influence the predictability of microbiology orders. How student behavior contributes to this effect remains to be determined.

REFERENCES

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