Editorial

The less you look, the less you find

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The article by Williams and colleagues\(^2\) shows a decreased incidence of ventriculitis when CSF samples are drawn from extraventricular drains (EVDs) less frequently. The authors compare a historical group of ICU patients to a prospective sample of ICU patients, in all of whom an EVD was placed for reasons not related to infections. In the historical group CSF samples were obtained daily, and in the prospective group samples were acquired every 3rd day. In the prospective group, there was a lower incidence of proven (CSF culture–positive) ventriculitis. This article describes a large experience and the study question is interesting. Even with no change in ventriculitis, reduced CSF sampling would reduce the cost of care in this group of patients. This is a welcome contribution to the literature. With the ever-escalating cost of care, we need more studies that evaluate reduced frequency interventions.

In my biased opinion, I agree that we do not need daily CSF cultures drawn from EVDs, but I find limited support for my opinion in this paper for the following reasons:

1) There were more CSF cultures obtained per patient in the retrospective group. Each time we do a diagnostic test there is a risk of a false-positive result. In this situation, false positives may occur due to contamination of the specimen or detection of a clinically insignificant infection. It is therefore possible that the underlying incidence of ventriculitis is the same but the group that is tested more frequently has a higher proportion of positive tests.

2) In the prospective group, antibiotic-impregnated catheters were used. These may have contributed to a reduced infection rate or they may have resulted in false-negative cultures in the prospective group.\(^1\)

3) When the prospective data collection began, the “staff was provided with an education package on the purpose of the study and the changes in practice.” Everyone knew that a study was in progress, that the purpose was to see if ventriculitis would decrease, and that they were being watched. It has been well demonstrated that in such circumstances people “try harder.” I wonder, therefore, if the bedside nurses may have been more meticulous about CSF sample collection or wound care to avoid contamination. Although well intentioned, this could have altered the study results.

4) Formal reviews of every patient with an EVD were undertaken by the investigators in the prospective group. This kind of detailed scrutiny probably did not occur in the preintervention group and could have altered the detection of ventriculitis in a positive or negative direction.

5) The authors’ hypothesis is that accessing or opening the sterile EVD/CSF system might cause infection and that reduced sampling therefore might reduce infection. In light of that hypothesis, other occasions when the EVD/CSF system was accessed are relevant. Repeat EVD insertions or revisions might cause CSF contamination; there were more patients in the retrospective group who had multiple EVD insertions. In addition there were some patients with bilateral EVDs, but the frequency in the 2 groups was not described. Similarly, when EVDs malfunctioned, they were flushed with sterile saline and the frequency of flushing in the 2 groups was not provided. These events are opportunities for contamination of the CSF and could have altered the incidence of ventriculitis.

6) Extraventricular drains were implanted in the operating room or the ICU. Was the incidence of infection different between these 2 sites and if so were the groups balanced on location?

Again, I am very happy to see assessments such as this, but I think there are a number of possible interpretations of the data: perhaps antibiotic-impregnated catheters work or result in false-negative cultures; perhaps 3rd-day sampling reduced contamination and caused the reduction in ventriculitis; or perhaps daily sampling was detecting organisms in the CSF that were contaminants or were asymptomatic and potentially resolved on their own.

In other words, the more you look, the more you find, and the true underlying incidence may be completely unaffected by the sampling frequency. It may simply be that the authors detected fewer cases of “ventriculitis” because they looked less often.

Disclosure

The author reports no conflict of interest.

References

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Response

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We thank Dr. Kestle for his comments and review. We have highlighted many of the points raised in the Editorial as limitations in our report. We acknowledge that there is a chance that “the less you look, the less you find” but point out that any patient with clinically suspected ventriculitis could have CSF tested at the time this was suspected, in addition to the routine samples after the change in routine sampling of CSF from once to once every 3rd day (the practice change). In 42 patients an additional sample was taken, so we believe it is unlikely that cases of ventriculitis were missed. Bacterial contamination of samples could have occurred before and after the practice change, but the case definition required evidence of infection to minimize the risk of false-positive results.

The majority of EVDs were inserted in the operating room, and there was no difference in the frequency of ventriculitis. The few patients who had bilateral EVDs were similarly distributed in both groups. Furthermore, we report the frequency of EVD changes and flushing of the EVDs, but the occurrence of ventriculitis in these patients was not affected by the practice change.

Reducing the incidence of ventriculitis is important because it is a significant adverse event. It is acknowledged that the cumulative effect of multiple factors may contribute to the incidence of ventriculitis. These include the type of catheter, method of insertion, and frequency of sampling. Minimizing disruption to the integrity of the EVD delivery system is likely to minimize the risk of ventriculitis. Studies of central venous lines and the management of parenteral nutrition have shown improvements in the incidence of catheter-related bloodstream infection with adherence to infection control principles.2,3

By extrapolation, it is not surprising that the introduction of a similar bundle of care1 and limited sampling and line disruption would reduce the frequency of ventriculitis.

References


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