Cleaned Reusable Laryngoscope Blades Contain Protein Deposits

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Introduction: Previous studies have demonstrated blood and microbial contamination on cleaned reusable anesthesia equipment. The demonstration of prion proteins in human tonsillar tissue has raised the question of transmission of variant Creutzfeldt-Jakob (vCJD) disease from anesthetic equipment exposure. Many institutions in the U.K, where prion-based disease is of greatest concern, have already switched from reusable laryngoscopes to disposable devices. Now that there have been two reported cases of vCJD in North America, we have decided to investigate the cleanliness of reusable laryngoscope blades. A recent study by these authors has already demonstrated protein contamination on cleaned reusable LMAs at an American university hospital.

Methods: 30 previously used, cleaned laryngoscope blades were collected form the operating rooms of an American university hospital. Six used, unclean blades were collected as positive controls, and two new, unused blades were used as negative controls. All 38 blades were stained for 20 minutes at room temperature using erythrosin B dye (1% solution.) The blades were rinsed with water and evaluated by three investigators in a blinded manner. The level of staining was graded from 0 (no noted staining) to 3 (very heavy staining) using strict criteria. The final scores for each blade was the arithmetic mean of each individual score.

Results and Discussion: We found some degree of protein staining on almost every previously used, cleaned blade. In general, staining was noted in the crevices around the replaceable light bulb, and at the junction of the blade with the handle. The mean score for cleaned reusable blades was 1.11 (95% confidence interval 0.86 to 1.37) while unclean blades scored 1.90 (95% CI 1.15 to 2.65) and the new blades were clean (both scored zero.) While it is important to note that the cleaned blades were statistically indistinguishable from the blades just removed from the patients' oropharynx, it is also important to note that 4 of the cleaned blades (13%) had a score of 2 or greater. This indicates at least a moderate amount of staining on a significant portion of the blades which we place in patients mouths every day.

Subgroup analysis did not show any difference between blades which were autoclaved in the process of cleaning and those which were cleaned with a purely chemical process.

Conclusion: This study demonstrates protein staining on laryngoscope blades that had been cleaned using conventional methods. While the clinical significance of this protein staining is unclear, the presence of these deposits may be of importance. In addition to study of disposable devices, laryngoscopes which contain the light source in the handle as opposed to the difficult to clean blade should be areas of further study.