Diagnosis and management are dependent upon assessment of the patient’s intra-abdominal pressure (IAP) as clinical examination is insensitive for detecting the presence of elevated IAP. Serial IAP measurements are widely acknowledged as essential to both the diagnosis and management of IAH/ACS. Some clinicians believe that IAP may be estimated by routine airway pressure (AWP) measurements due to the physiologic transmission of IAP across the patient’s diaphragm.

The accuracy of such estimates has not been validated however. Studies have shown that a variable percentage (20-80%) of IAP is transmitted across the diaphragm. Airway pressure measurements have a poor correlation with the IVP gold standard measurement, intravesicular pressure (IVP). Failure of AWP measurements to accurately predict changes in IAP, this would increase mortality in the critically ill primarily due to their compromising effects on vascular flow (Figure 1).

OBJECTIVES/HYPOTHESIS

The goal of the current investigation was to examine the relationship between IVP and AWPs to determine their equivalence in the prediction of IAP. In consideration of recent data suggesting little to no significant effect of IAP on AWP readings, it was hypothesized that the accuracy of AWP measurements in the prediction of IAP would not significantly agree with that observed in IVP.

RESULTS

Twenty mechanically ventilated intensive care unit patients at risk for IAH / ACS were evaluated. Eighty-six percent were male, mean age 54 ± 17 years, with various mechanisms of injury (Figure 3). Mean positive end-expiratory pressure (PEEP), PIP, Paw, and Pplat measured in Table 1. Results of correlation studies of IVP and AWPs demonstrated as correlation coefficient (r) and statistical significance value (p). Bland and Altman Analyses indicate mean difference ± standard deviation (SD) and 95% limits of agreement (LOA) (Figure 4). Each study demonstrated, however, that airway pressure measurements have a poor correlation with the IVP gold standard measurements rendering them inaccurate measurements of IAP. Standard IAP measurements, most commonly performed by IVP, remain necessary to accurately detect IAH / ACS.

DISCUSSION/CONCLUSION

Airway pressure measurements are commonly performed in the mechanically ventilated patient at risk for IAH / ACS. Were such measurements to accurately predict changes in IAP, this would increase implementation of IAP assessment in the ICU setting as well as facilitate continuous IAP monitoring. This study demonstrates, however, that airway pressure measurements have a poor correlation with the IVP gold standard measurements rendering them inaccurate measurements of IAP. Standard IAP measurements, most commonly performed by IVP, remain necessary to accurately detect IAH / ACS.

REFERENCES