Objective: Ventilator-associated pneumonia (VAP) is a common hospital-acquired infection among neonatal intensive care unit patients. However, no gold standard exists for diagnosing VAP in neonates and consensus guidelines for empirical antibiotic therapy to treat presumptive VAP have not been published. The objective of this study is to determine the effectiveness of Gram staining of tracheal aspirates for predicting causative microorganisms and guiding appropriate initial antibiotic therapy to treat ventilator-associated pneumonia in extremely preterm neonates.

Study Design: A prospective study was conducted on all episodes of presumed VAP in neonates with a gestational age below 28 weeks at birth between April 2007 and April 2011.

Results: Gram-positive cocci and Gram-negative bacilli were the causative microorganisms in 18 and 72 confirmed episodes of VAP, respectively. The sensitivity and specificity of Gram staining were 89% and 96% for Gram-positive VAP and 96% and 89% for Gram-negative VAP, respectively. The positive predictive value for Gram-positive and Gram-negative VAP was 84% and 97%. The initial antibiotic therapies based on Gram stain findings were appropriate for 94% (85/90) of patients with VAP.

Conclusions: Gram staining of tracheal aspirates is useful in predicting classes of causative microorganisms and for guiding appropriate initial antibiotic therapy for VAP in extremely preterm neonates.