**Rational and Hypothesis** Human Rhinovirus (HRV) infections are major contributors to the increased morbidity burden associated with asthma and COPD acute exacerbations. There are currently no effective treatments or vaccines targeting exacerbations, therefore understanding the host–virus interactions that drive cellular damage will help identify potential therapeutic targets. Viral infections alter the airway environment through increased production of inflammatory mediators, defensive factors and viral proteins. This Results in the upregulation of cellular processes such as the unfolded protein response (UPR), an ER (endoplasmic reticulum) stress pathway that acts to alleviate ER stress caused by increased demands on protein synthesis. In the event that UPR fails to restore cellular homeostasis, pro-apoptotic pathways are activated. Many viruses induce ER stress and have evolved mechanisms to modify UPR to promote their own replication. Interestingly, the mechanisms and consequences of HRV-induced ER stress in bronchial epithelial cells have yet to be explored. We therefore hypothesised that HRV infection induces and manipulates ER stress processes within bronchial epithelial cells.

**Objectives** To explore the mechanisms and consequences of HRV-induced ER stress within bronchial epithelial cells.

**Methods** The immortalised bronchial epithelial cell line, BEAS-2B was infected with HRV for 1 hour at MOI 1.5. Induction and subcellular localisation of ER stress markers (GRP78 and ATF4) were measured at different time points by western blotting and confocal microscopy. Tunicamycin (a known ER stress inducer) and filtered HRV were included as positive and negative controls respectively.

**Findings** Virally infected BEAS-2B cells induced ER stress as evidenced by the significant induction of the UPR chaperone protein, GRP78 at 24 hour. ATF4, a transcriptional activator of UPR target genes, redistributed from a cytoplasmic location to perinuclear regions, as assessed by immunofluorescence and confocal microscopy. Translocation was seen from an early as 1 hour following treatment with Tunicamycin, but this response was relatively delayed in HRV-infected BEAS-2B cells, with ATF4 redistributing to perinuclear regions from 8 hour post infection.

**Conclusion** Our data demonstrate for the first time HRV-induced ER stress within bronchial epithelial cells, and suggest that HRV may manipulate ER stress pathways to facilitate its own replication.