



# The Intensive Care Society

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## Young Investigator Award Winner

### **What is the functional importance of vitamin D deficiency upon local and systemic inflammation in patients undergoing oesophagectomy?**

Dr Dhruv Parekh, University of Birmingham

Acute lung injury (ALI) is the final common pathway of response to a variety of direct and indirect pulmonary insults but only a relatively small proportion of patients at risk of the syndrome develop ALI.

Vitamin D has profound effects on human immunity acting as an immune system modulator, preventing excessive expression of inflammatory cytokines and increasing the 'oxidative burst' potential of macrophages, therefore enhancing bacterial killing. The role of vitamin D deficiency has not been studied in human ALI.

We hypothesise that severe vitamin D deficiency is a predictor of adverse outcome in patients at risk of acute lung injury post-oesophagectomy due to pulmonary inflammation and alveolar epithelial dysfunction part driven by exaggerated Th17:Treg lymphocyte responses and defective innate immunity.

We propose translational studies upon 60 cases at risk of ALI following transthoracic oesophagectomy.. Patients will undergo bronchoalveolar lavage (BAL), measurement of extravascular lung water and collection of plasma at defined perioperative timepoints and if they subsequently develop ALI.

We will determine if vitamin D deficiency pre-operatively is associated with elevated alveolar and systemic inflammation, physiological evidence of alveolar epithelial damage/ permeability, and defective innate immunity. Further using cell culture and flow cytometry , we will study whether vitamin D status influences pre and post-ALI T cell phenotype.

This study should therefore provide evidence to support vitamin d replacement trials in patients with or at risk of acute lung injury