Proton pump inhibitor medication is an independent risk factor of gut flora in the oropharynx at admittance to hospital or ICU

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Background and Aim of Study: The normal body participates in a mutualistic balance with a large range of microbiota. Illness and medication alters the normal bacterial balance and cause bacilli that normally only thrive in the gut to wander up the digestive tract and inhabit the oropharyngeal tract (1). This imbalance enhances the risk of developing nosocomial pneumonia (2). The primary goal of this study was to establish whether there is already at admittance to hospital an imbalance in the oropharyngeal flora, and whether there is a difference in flora between ICU and ward patients. The secondary goal of this study was to explore whether there are patient characteristics correlating to a disturbed oropharyngeal flora.

Materials and Methods: Oropharyngeal cultures were obtained from three different study groups: 1) controls in the community, 2) patients admitted to hospital wards, and 3) patients admitted to the ICU. Oropharyngeal cultures were obtained within 24 hours of admission.

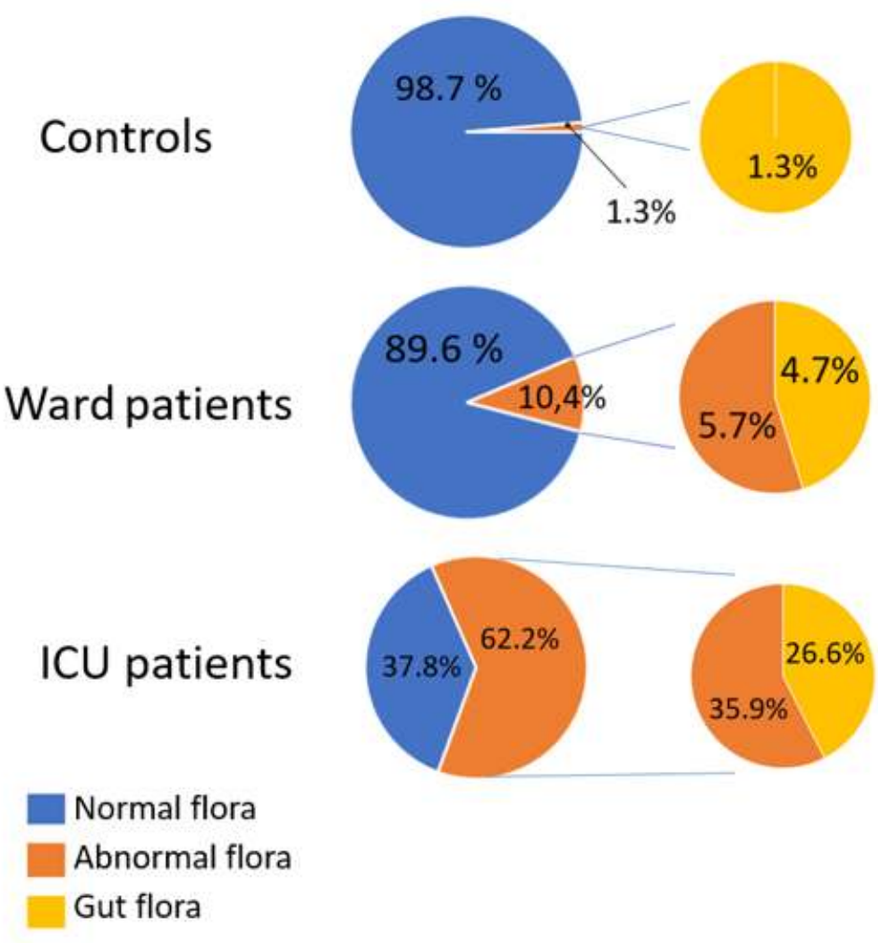

Fig.1. *Results from oropharyngeal cultures showing a significant difference in oral flora in the three study groups.*

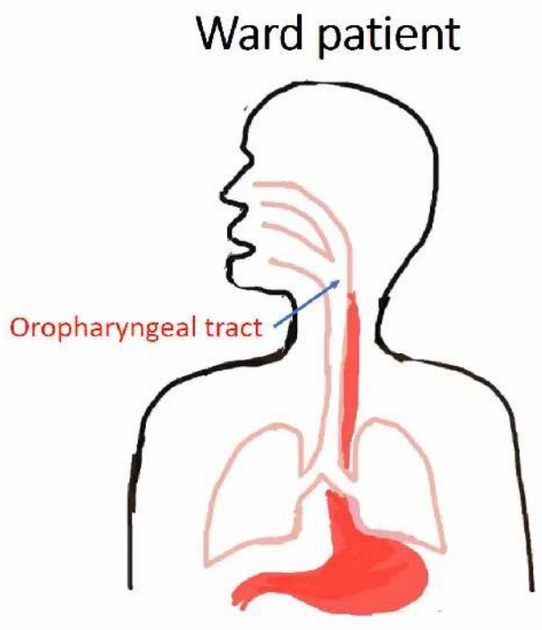

Fig.2. *Potential risk factors tested for correlation to gut flora in the oropharynx in ward and ICU patients.*

Results and Discussion: Oropharyngeal cultures were obtained from 487 individuals: 77 controls, 193 ward patients, and 217 ICU patients. Abnormal pharyngeal flora was more frequent in ICU and ward patients compared with controls (62.2% vs 10.4% vs 1.3%, $p<0.000$). Colonization of gut flora in the oropharynx was more frequent in ICU patients compared with ward patients or controls (26.3% vs 4.7% vs 1.3%, $p=0.001$). In a multivariable logistic regression model, PPI was the strongest independent risk factor for the presence of gut flora in the oropharynx in both ward patients and ICU patients (OR 4.82, 95%CI 1.16 - 19.96, p= 0.030 vs. OR 2.94, 95%CI 1.36 – 6.36, p= 0.006).

Conclusion(s): This study indicates that abnormal oropharyngeal flora and presence of gut flora in the oropharynx is an early and frequent event in hospitalized and critically ill patients. PPI medication is an independent risk factor for colonisation of gut flora in the oropharynx.

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2. George DL et al. Epidemiology of ventilator-acquired pneumonia based on protected bronchoscopic sampling. Am J Respir Crit Care Med. 1998 Dec;158(6):1839-47.

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