

A comparison of microbiome-effects from using short and long antibiotic treatment lengths

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The extensively use of antibiotics is reckoned as one of the main driving forces associated with increasing number of antibiotic resistant bacteria. Factors such as concentration of the antibiotic compound and length of exposure, may affect the selection of resistant strains. It has e.g. been demonstrated that longer treatments have been associated with increased rates of resistance development. At the same time, several studies have demonstrated successful treatment of bacterial infections by reducing antibiotic treatment duration compared to standard durations. Implementation of shorter treatment duration is regarded as safe and has been recommended as a standard procedure.

Further, it is also known that antibiotics affect the bacterial composition in the human microbiome. It has been demonstrated that such disturbances in the microbiome may potentially have disease causing effects; e.g. acute or chronic gut infections caused by other opportunistic bacteria such as *Klebsiella pneumoniae*, immune homeostasis, deregulated metabolism and increase risk of allergy and asthma.

As several studies has demonstrated effective treatment of several infections using antibiotics of shorter duration, it is highly relevant whether shorter treatment durations also reduce the effects on the microbiome. In this study we will investigate effects in the microbiome from antibiotic treatments with different duration. We hypothesize that shorter duration treatments show reduced effects on the microbiome compared to treatments with longer durations and additionally lower rate in resistance development. If proven to be so, this would strengthen the argument in reduced duration of antibiotic treatments.