Understanding the Dynamics of Viral Shedding within Norovirus Infected Subjects
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Introduction

- Norovirus (NoV) is a contagious virus that causes gastrointestinal illness in humans. Its main symptoms are diarrhea and vomiting.
- Infections can often be asymptomatic but individuals, regardless of their symptoms, shed large amounts of NoV in their stool.
- With a scarcity of available animal models, many aspects of NoV infections are poorly understood.
- The dynamics of viral load within human hosts can explain the course and severity of infection and help researchers develop novel norovirus treatments.

Materials and Methods

- We used the data collected by two norovirus challenge studies – Leon et al (2011) and Newman et al (2016) – to understand the dynamics of viral load in NoV infected subjects.
- Infection was defined as having at least one sample of either stool or emesis test positive by RT-qPCR for NoV RNA.
- Out of the 55 subjects, 15 got infected with the virus and their stool viral load was measured over a period of days.
- From their data, we extracted the variables related to shedding and tidied up the data sheets in Rstudio.
- Viral shedding, or total shedding, for each subject each day was measured by:
  - the weight of sample stool X the titer of the sample
  - To estimate more accurate shedding and to understand the total amount of virus a patient shed over the course of their infection, we found the Area Under the Curve of their total shedding curve.
- We calculated the means for key variables including peak viral titer, time to peak, and duration of shedding.

Results

- The limitations of this project were that the 15 infected patients were considered a low power for the research, and some subjects were not followed long enough to get total shedding information.
- For future challenge studies, larger sample sizes should be used to examine the effect of norovirus dosage on humans.
- More comparisons also need to be made between asymptomatic and symptomatic patients.
- Further research is needed to find the correlation between different humans symptoms and viral load in norovirus infected subjects.

Discussion

- The day patients shed their peak viral titer post inoculation. The minimum number of days was 3 and the maximum was 15.

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