

Abstract

Cholera is an infectious disease caused by the bacterium *Vibrio cholerae* rampant in countries with inadequate access to clean water and proper sanitation. In this work a mathematical model for cholera incorporating the dynamics of the induced achlorhydria condition and treatment is analysed. Michaelis-menten equation in microbiology is used to show variation in pH level of the hydrochloric acid in the digestive system. *Vibrio cholerae* are acid labile and thrive well in alkaline medium. Once the gastric pH is raised by factors like antacid drugs or surgery the stomach medium become suitable for *Vibrio cholerae* to thrive and multiply very fast than healthy people. This lead to cholera transmission as the infected individuals with induced achlorhydria condition shed more folds of *Vibrio cholerae* to the environment. If individuals with achlorhydria condition are treated, the effect of cholera outbreak is reduced. The existence and stability of the equilibrium points is established. Analysis of the model show that the disease free equilibrium is both locally and globally asymptotically stable when the basic reproduction number is less than unity, while the endemic equilibrium is locally asymptotically stable when the reproduction number is greater than unity. Numerical simulations is done using MATLAB software to show the effect of the induced achlorhydria condition on the spread of cholera and individuals with this condition suffer severe infection during cholera outbreak.