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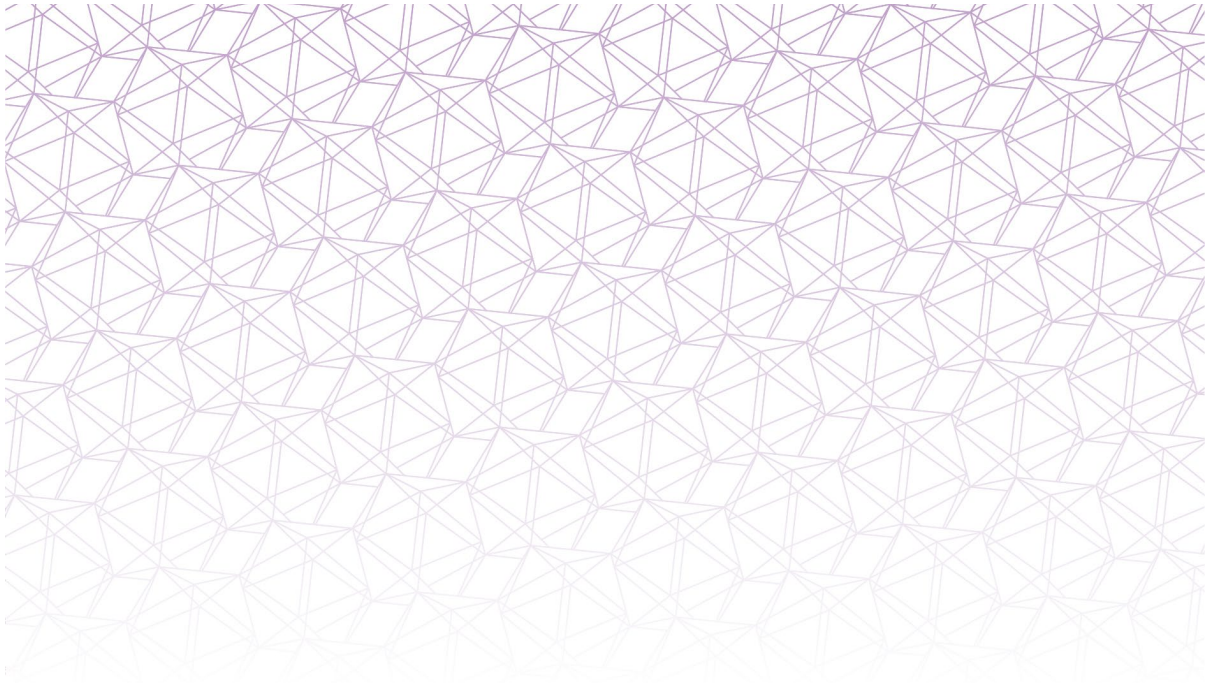
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Rotavirus: Annual Public Health Concern in Jordan

Public Awareness Bulletin

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Introduction

Rotavirus is one of the leading causes of annual severe diarrhoeal cases and acute gastroenteritis among children under 5 years of age, in Jordan and worldwide. Children older than 5 years are susceptible to the rotavirus infection as well, but the severity of the disease varies and depends on the mature status of the immune system. In the severe cases among neonates and infants under 3 years of age, the disease might be life threatening and lead to death. Before Jordan introduced the vaccine in 2015, local studies conducted between 2006 and 2011, showed that the morbidity rate (number of diseased cases in a given period for a given population) in Jordan was approximately 44% [1,2,3 & 4] According to WHO, the current global fatality rate (number of deaths among the infected cases) of the disease is 2.5% [5].

Although it is well recognized that older children and adults, particularly those who are immunocompromised, elderly, or provide care for small children, are vulnerable to rotavirus infection [6], it is still unclear how the disease develops in those who are five years of age or older. The scant data on rotavirus disease among adults has led to criticism of rotavirus attribution for diarrheal burden, along with other viruses [7].



Mode of Transmission

The rotavirus transmits through three modes:

- Oral-Faecal Route *via* consuming food or water contaminated with the virus;
- Directly from person to person *via* close contact with bodily secretions; or,
- Indirectly *via* contaminated objects or fomites.

The peak of rotavirus transmission among children usually occurs between January and June [8, 9]. According to research on rotavirus epidemics, rotavirus gastroenteritis (RSVG) is largely caused by changes in the climate.

Clinical Signs

The clinical picture of the disease varies from transient diarrhea, abdominal pain and mild fever, to severe gastroenteritis, vomiting and fever that can result in dehydration with shock, electrolyte imbalance, and death. In adults, the virus usually develops no symptoms or mild disease presented with nausea, abdominal pain, fever and diarrhea. Common disease prevalence in adults came from endemic area, travel-related infection and child-to-adult transmission. Limited diagnostic and therapeutic alternatives are available for adults with suspected rotavirus infection. Because symptoms are generally self-limiting, supportive care is the rule [10]. Rotavirus should be taken into account in the differential diagnosis of adults with gastroenteritis by clinicians [10].

The incubation period (the time from virus entry to the body until appearance of the clinical signs) is 1 to 3 days. The symptoms may last from 3 to 7 days in normal cases, and might be extended up to 2-3 weeks [5]. Immunocompromised individuals are more susceptible to the disease and more likely to develop severe cases [11].



Prevention & Control

A. Preventive Measures [5, 6, 12]



Access to safe drinking water



Improve house sanitation
(maintain good environmental hygiene)



Good hand-hygiene practice and
food hygiene (food safety practices)



Ensure sterilizing milk bottles



Ensure good food storage
(especially during weather of high
temperatures) and avoid consuming
immature fruits



Health education and awareness -
Advocate the importance of hygiene

B. Rotavirus Vaccine

- In 2007, WHO approved and recommended the introduction of rotavirus vaccines to the countries with high prevalence of rotavirus infection to reduce the incidence of the disease. In 2015, the Ministry of Health in Jordan adopted and introduced the Rotateq@ [13] vaccine to the national vaccination program. This vaccine is a live-attenuated vaccine composed of five reassortant rotavirus strains. The vaccine is given orally on three doses (between 6 to 32 weeks of age) [14].



Role of RSS

I. Scientific Research

- In order to assess the impact of introducing the rotavirus vaccine to the Jordanian National Vaccination Program, a research team from the RSS Bio-Safety & Bio-Security Centre conducted in collaboration with the Jordanian Royal Medical Services a post-vaccination introduction study between 2018 and 2019. Where stool samples from pediatric patients under five years of age who were admitted to selected military hospitals in middle and north of the Kingdom and suffered from acute gastroenteritis associated with diarrhea, were collected to detect the presence of rotavirus. The study revealed significant decrease in the prevalence of rotavirus among diarrheal-diseased children. In addition, the study had checked the potential shedding of the vaccine strains in the stool of vaccinated children. The results of this study was published in 2020 in a peer-reviewed journal and disseminated to officials at Ministry of Health and national stakeholders.

Alrwashdeh M, Almaayteh M, Kaabneh A, Haddadin W, Ababneh M, **AL-Hmoud N** (2020)

Prevalence of rotavirus infection in pediatric patients after introduction of the Rotateq[®] vaccine in Jordan. Eurasia J Biosci 14: 4853-4860.

II. Laboratory Testing

- Since 2019, the virology and molecular biology laboratory of the RSS Bio-Safety & Bio-Security Centre validated and introduced lab-testing methods for the molecular detection of rotavirus in various types of samples (water, sludge, soil, and food). The laboratory adopts advanced molecular techniques such as (Reverse Transcriptase – Polymerase Chain Reaction "RT-PCR") to identify the circulating rotavirus genotypes and discriminate between the wild and vaccine rotavirus isolates. With recent introduction of the Next-Generation Sequencing technology to the RSS, the laboratory has the ability to conduct Whole-Genome Sequencing "WGS" of the rotavirus genome and characterize its molecular characteristics.



Summary

Many measures can be taken to prevent rotavirus infection. Vaccination is crucial and considered as the most effective strategy to reduce incidence rates. Good hygiene practices, such as regular handwashing, and managing faeces and vomitus, are essential. Adhering to food and water safety measures are also important. By implementing these strategies, the risk of rotavirus infections can be significantly reduced, especially in infants and young children.

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