Republic of Iraq
Ministry of Higher Education
& Scientific Research
AL-Muthanna University
College of Science
Department of Biology

The impact of Molecular detection of Rotavirus and IL-8 polymorphs in children's infected with gastroenteritis

A Thesis Submitted to the Council of collage of Science /Al Muthanna University as Partial Fulfillment of the Requirements for the Degree of Master of Science in Biology

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2023 A.D 1445 A.H

بسم الله الرحمن الرحيم

((وَعَلَّمَكَ مَا لَمْ تَكُنْ تَعْلَمُ وَكَانَ فَضْلُ

اللَّهِ عَلَيْكَ عَظِيمًا))

صدق الله العلي العظيم

سورة النساء 113

Supervisor's Certification

I certify that this thesis entitled "**A Thesis Submitted to the Council of collage of Science /Al Muthanna University as Partial Fulfillment of the Requirements for the Degree of Master of Science in Biology**"

Was prepared by "*Sami Kamel Ajeel*" under my supervision at the Department of Biology the College of Science / University of Al- Muthanna, as a part of the Requirements of the Master Degree of Science in Biology.

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Date: \ \ 2023

Dedication

In the name of Allah and enormous thanks for all his giving

I dedicate my efforts to:

To the Savior of mankind, Imam Mahdi (may God hasten his

Reappearance.

To the moon that does not fade away and the sun that never gets

The secret of my strength …….....My dear parents (my father

and my mother, may God prolong her life) who filled me with love and made space for the realization of my ambitions,

To the sunshine of my life, these who always there for me when I need them, pick me up when I fall, stick up for me…..... My dear

brothers my sisters.

Sami

Acknowledgements

While I am putting the final touches on this study, first and foremost, I would like to thank “ALLAH” Almighty for giving me the strength, knowledge, ability, and opportunity to undertake my academic goals. And I cannot but extend my thanks to everyone who had a contribution, even a small one, especially Asst Prof.Dr Noor Sami Aboud, the supervisor of this thesis, who was credited after God Almighty in illuminating the path of research for me through her directives and instructions.

I also extend my thanks to the deanship of the College of Science / Al Muthanna University and department of biology for providing the necessary facilities during the study.

I would like to express special thanks to patients, children and their families who provide the study with the sample.

I also extend my sincere thanks and gratitude to the Dr. Ali Al-Marzouki, who shared greatly in helping me reaching the highest level of the thesis, and last but not least, I offer my sincere thanks and my appreciation to Msr.Shreehan, who had special touches and added the best to my thesis.

Finally, I would like to thank all the people who encouraged me while carrying out this research.

Sami

Abstract

Rotavirus is the main infective agent of acute gastroenteritis (AGE) in children under the age of two years causing significant morbidity as well as mortality throughout the world.The purpose of this study is to determine the frequency of the one of the most important enteric viruses (Rotavirus) in stool specimens of children less than 2 years, and the study of the relationship between Rotavirus and the levels of interleukin-8 in infants serum during infection as well as the association between the rate of infection and IL-8 polymorphism gene. The age ,sex distribution, type of feeding and the area of residence were noted. A total of 100 fecal, blood and serum (50 healthy control) and 50 patients specimens (including 28 males and 22 females) were collected from infants under 2 years of age in Al_ Muthanna Governorate in South of Iraq during four months (from November 2021 to March2022). The samples were classified into four groups according to the age of the children: ≤5 months, 6-10 months, 11-15months and 16-20 months . Rotavirus was detected by using RT_PCR technology, while the levels of IL-8 were determined by ELISA. On the other hand, polymorphism of IL-8 were identified by PCR.

The results of this study revealed that Rotavirus were the main cause of diarrhea for children which about 76% of total patients .The results showed that the number of male infants diarrhea patients (22) was more than their female (16). The number of infants infected with diarrhea, caused by Rotavirus was high (16)in age group ≤5 months. The infected infants with Rotavirus were classified according to their feeding; natural, mixed and artifical feeding. The number and ratio of infected infants with Rotavirus were 2 (5.3%), 17 (44.7%) and 19 (50%) respectively. There was a significant increase in the levels of IL-8 in infected infants, amounting to (296 pg/ml) compared to the control group (94.1 pg /ml). As for the gene polymorphism of IL-8

for patients infants, the cases were 15,78 out of the total positive samples, with six cases, 4 males and 2 females , while the age group between the first month to one year was the highest with four cases than in the other group from 13 to 24 months two cases. It is concluded from this study that human Rotavirus is the main causative of acute gastroenteritis in infants under 2 years old in Al-.Muthanna Governorate and has a positive relationship with an increase in IL-8 levels in the serum of the infected infants. The study showed a slight relationship between IL-8 polymorphism genetic variation and Rotavirus infection. It may cause sporadic infection in closely groups of children and this should be considered while treating acute gastroenteritis patients.

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List of Abbreviation

Abbreviation	Meaning
AGEI	Acute gastroenteritis Infection
AGE	Acute gastroenteritis
ROV	Rotavirus
DsRNA	Double strands RNA
IL-8	Interleukin-8
CXC	Cysteine –X-Cysteine
NK	Natural killer cells
cDNA	Complementary DNA
PCR	Polymerase Chain Reaction
RT-PCR	Real-Time-PCR
RNA	Ribonucleic acid
NSP	Non-structural protein
ICTV	International Committee for virus Taxonomy
DLPs	Double layered particles
RVGE	Rotavirus gastroenteritis
HIV	Human immunodeficiency virus
Nis	Nosocomial infection
EM	Electron microscopy
ELISA	Enzyme link immunosorbent assay
IFNs	Interferons
NIPs	National immunization program
WHO	World Health Organization
CXCR1	Cystine-X-Cysteine Receptor 1
CXCR2	Cysteine-X-Cysteine Receptor 1
IBD	Inflammatory bowel disease
UC	Ulcerative colitis

PMNs	Polymophonuclear cell
VTM	Viral transport media
EDTA	Ethylene diamine tetra acetic acid
DNA	Deoxyribonucleic acid
Cdna	Complementary DNA