Prevalence of Untypable HCV Variants in Different Districts of Punjab, Pakistan and a Case Report of its Treatment Strategy

BY

Ayesha Zafar ID: 15001254009

SUPERVISOR Dr. Muhammad Sohail Afzal

Department of Life Sciences School of Science

University of Management and Technology,

Lahore, Pakistan

2017

Prevalence of untypable HCV variants in different districts of Punjab, Pakistan and a case report of its treatment strategy

---

Submitted to University of Management and Technology Lahore

In partial fulfillment of the requirements

for the award of degree of

MS

IN

BIOTECHNOLOGY

BY

AYESHA ZAFAR

ID

1	5	0	0	1	2	5	4	0	0	9

Session: 2015-2017

Department of Life Sciences


بسم الله الرحمن الرحيم

Acknowledgments

In the name of ALLAH, the most compassionate and Merciful. All the praise and love be to ALLAH, Lord of the world Who is entire source of knowledge delivered to human being. I pay my gratitude to ALLAH for empowering me with the knowledge and potential to initiate, carry out and complete this project. All my respect for HOLY PROPHET (PBUH) Who is forever a model of guidance and knowledge for humanity as a whole.

I would like to express my special appreciation and thanks to my supervisor Dr. Muhammad Sohail Afzal, Assistant Professor, Department of Life Sciences, University of Management and Technology, Lahore for being an awesome and tremendous mentor for me. I would like to thank you for supporting me, encouraging my research and for allowing me to grow as a researcher. Your advice on both the research and my career aspects has been priceless.

I am thankful to Dr. Nouman Rasool (Chairperson Department of Life Sciences, University of Management and Technology, Lahore) for his consistent appreciation.

A special thanks to my family. Words cannot express how I am grateful to my parents Mr. & Mrs. Zafar Tariq for all of their care and sacrifices during my whole educational career. Your prayers were a matchless treasure for me that gave me strength. I would also like to thank my friend Mahish Kabir, for her appreciable perpetual assistance during my research work, thesis writing and encouraging me to strive towards my goal. At the end I would like to express appreciation and love for my beloved brother Mr. Muhammad Awais Abdullah and sister Mahnoor Zafar, without their support I would have never been able to reach where I am today.

AYESHA ZAFAR

DEDICATION

I dedicate

My work to

MY BELOVED PARENTS

MR. AND MRS. ZAFAR TARIQ

And to my siblings for their endless support during my whole educational career.

DECLARATION

I AYESHA ZAFAR D/O MUHAMMAD ZAFAR TARIQ ID: 15001254009 Session 2015-2017 declare that the matter printed in the thesis dissertation titled "Prevalence of untypable HCV variants in different districts of Punjab, Pakistan and a case report of its treatment strategy" which I here with submit for the research qualification **M.S Degree In Biotechnology** to the Department of Life Sciences, School of Science, University of Management and Technology, Lahore, Pakistan is apart from the recognized assistance of my supervisors, my own work and has not been previously submitted as research work, thesis or publication in any form in any university, research institution etc. in Pakistan or abroad to obtain a research diploma or degree.

Dated: _____

AYESHA ZAFAR

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

In Pakistan, around 11 million people are HCV infected with 6 circulating genotypes and subtypes in Pakistan and the viral burden is still on rise. HCV genotype determination is necessary to help the health care facilitators for recommending the appropriate antiviral therapy. This large scale study was carried out to investigate the epidemiological distribution of genotypes in different districts of Punjab, Pakistan and focuses on prominently increasing one (diagnostically untypable) and its possible antiviral therapy. We have also characterized an untypable HCV variant by sequence and phylogenetic analysis that showed the greatest homology of untypable HCV variant with 3a genotype from Pakistan (Unpublished data). A case study has been followed up with untypable HCV genotype for 24 weeks. Of the 8353 patients enrolled in study, the genotype 3 and subtype 3a **(n= 6650, 79.6%)** was most significantly prevalent throughout the study followed by undetermined genotype i.e untypable **(n= 1377, 16%)** by the diagnostic method of Ohno *et al*. The presence of untypable variants suggested that there are some novel or quasi species prevailing among HCV patients in local community. Case of patient with untypable genotype had been treated effectively with interferon alpha plus ribavirin therapy for 24 weeks and achieved SVR rate of 70-80 %. From the study, it can be concluded that untypable variants can be successfully treated with standard interferon therapy unless the mystery of untyped genotype has been solved with novel and effective diagnostic methods

INTRODUCTION

1.1 Hepatitis

Viral hepatitis is illness of the liver caused by a virus. Hepatitis C is a long haul disorder, around 20-30 years with a moderate development. In hepatitis C, 80% of intense initial infections change to chronicity. The consequences of HCV disease can be resolved within a half year of disease exposure. Most of the HCV patients may develop cirrhosis and, eventually, hepatocellular carcinoma. Around 80% of HCV diseases prompt chronicity which are predominantly because of age, male sex, stoutness, liquor consumption and co-contamination with HBV (hepatitis B infection) or HIV (human immune-deficiency virus) (Vaquer *et al*., 1994), development of viral quasi-species that escape immune resistance (Farci *et al.*, 2000) and deficient cell reactions (Bowen and Walker, 2005).