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RESEARCH ARTICLE

UNCOVERING THE HIDDEN TRUTH BEHIND EMERGENCE OF COVID-19 OUTBREAK. IS FORENSIC VIROLOGY THE ANSWER ?

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ABSTRACT

This article is a genuine attempt by authors to collect literature available in forensic sciences and the its bridging with epidemiology and virology to come up with the importance of forensics in dealing with outbreak of COVID19 in its own exclusive mechanism. As the sudden outbreak of Pandemic COVID-19 has jeopardised healthcare sector across the globe because of its high infectivity, mortality rate and absence of any certain vaccine so far, a look into importance of Forensic virology may crack the code and make it easier for not just the scientific community but the global administration to untie many mysterious knots.

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INTRODUCTION

As the entire world is dealing with outbreak of COVID19, People may wonder what forensics may have to do with a disease whose causative virus, sign and symptoms are known and the scientific fraternity world wide is working day and night to find cure of the same. Forensics may not have an immediate or key role in defining a pandemic but it certainly does play a significant game in prevention and preparation of a pandemic. Authors have collected the literature available on Forensics with its connection with study of virus and correlation with epidemiology to find some very interesting facts about Pandemics leaving a question on its being a natural occurrence or a bioweapon in today's time where there is a constant cold war among power axis of the world. To treat a disease is important but what is equally important to find the how and why of any disease especially if its a Pandemic and is likely to change the Economic and healthcare dimension on Global platform.

Elucidation: As in current timeline all field of science is working day and night to deliver their best for the goodwill of global population.

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Key leaders in dealing and handling COVID19 Outbreak are Physicians, ICU experts, Virologist, Microbiologist and Pharmacologists by taking care of patient post hospital administration, understanding the nature of causative coronavirus and detecting possible treatment for the same respectively one may surprise what role forensics may have to play in this serious pandemic time ? Forensics science is considered among medical fraternity as the science of dead and autopsy, but Forensic itself is a vast field having many branches of its own which deals beyond dead bodies with a purpose to understand and prevent death. Like in Specialties of Medicine and Surgery their are further specific branching for example internal medicine, paediatric medicine, geriatric medicine, orthopaedic surgery, gastrointestinal surgery etc, even Forensic sciences have many varied branches one of which is Forensic Virology. Forensic virology is the study of viruses in forensic context. Virus cannot just infect but that infection can cause death either as a natural process or as a criminal act (e.g. Bioterrorism) a lot of debate is going around the globe if coronavirus is natural or artificially engineered in a laboratory with a purpose of using it as a bio weapon. Where as a virologist can understand the type, strain, pathogenesis and morphology of a virus a forensic virologist can go a step ahead to rule out if its a man made virus through the process of "trace back investigation" which refers to the process of

tracing a virus back to its source in order to find out where an infection has come from. Analysis of microbial genetic sequences and phylogenies have become increasingly important in the tracking and investigation of events leading to infections. It has recently been proposed that these activities be termed microbial forensics. Studies of HIV have frequently assumed a pivotal role in this developing discipline. Since the evolutionary rate of HIV is so great that it is unlikely to isolate viruses with identical genomes, their sequences provide an exquisite tool to investigate their evolution. The proper use of phylogenetic analysis to study the evolutionary patterns of variation in this retrovirus can enable investigators to discern events during its spread through a population. Knowing the fact that Virus process with much complexity in comparison to fungus and bacterias and tend to change their genetic information within the host during replication, its always difficult to create a very effective vaccine for the same. If documents are to be believed Viral infections in the past such as Small Pox (Variola virus – Orthopox virus) 1980, Viral Hemorrhagic fever with the pattern of their spread were bio weapon. Considering the cold war and international political stature of power the possibility of COVID 19 as a bioweapon can not be ruled out over head and to be more concrete and impartial forensic virology plays a very significant role. Where as while dealing with a Pandemic the pathology labs aims to diagnose the presence of virus in specimen received of a patient and at the same time tend to understand the processing of the virus in human body i.e pathophysiology along with trying to understand the virus better to come up with vaccine of the same; in routine for COVID19 Diagnosis test such as PCR and Rapid Antigen tests are being performed with an aim to confirm presence of the same in a human, Forensic virology uses more advanced tests like Random Amplified Polymorphic DNA (RAPD), Terminal restriction fragments length polymorphism (TRFLP), Amplified ribosomal DNA restriction analysis (ARDRA), Amplified fragment length polymorphism (AFLP), Denaturing gradient gel electrophoresis (DGGE), Temperature gradient gel electrophoresis (TGGE) can be used by forensic virologist to find out creation of genetic maps for new species, determination of relatedness among species, establishment of linkage groups in parentage disputed case and its possibility of being a natural virus of lab engineered virus.

It is crucially important to find out if the virus is natural or engineered to work in focused direction to come out with the vaccine as soon as possible depending upon its origin and pattern which will not just save time and money but very many lives which can potentially be lost either due to the infection due to its aggressive pattern or delay in finding an absolute treatment; or during the drug trial by using every arrow in the quiver. The Forensic virology can even trace patient history to determine the difference in presence of strains in different continent, the status of infectivity, mortality rate, aggressiveness of a single name virus across different sub continents. This aids in understanding the nature of virus even better and to conclude if there are limited strains or if the virus is impersonator. For example The researchers used genome wide comparative sequence analysis to compare an isolate of HSV-1 called KOS63 with a more virulent strain known as KOS79, reportedly isolated from the same volunteer on separate occasions. A similar study by Cristopher et al revealed how Viral forensic genomics reveal the relatedness of classic herpes simplex virus in different strains. During the outbreak and struggle among Scientific fraternity to deal with COVID-

19 Pandemic a forensic virology research may also allow scientist to understand how a patient's viruses influence the course of disease depending upon factors such as geographic location of patient, travel history, a, time difference between the onset of disease across the globe, the nation and in the patient of different age and co morbidities. Recently in an article by Ahmad Samarji discussing about forensic virologists, he said "Their role in these extremely challenging times is to ensure the proper management of dead bodies, minimizing the spread of the virus, and to guide authorities, hospitals and funeral directors about the "do's and don'ts" of dealing with these bodies." While a lot is known about the coronavirus family, much is yet to be understood about the transmission modes and effects on the body of SARS-CoV-2, the virus that causes COVID-19. We don't know whether human remains are infectious, but the likelihood is high. So forensic pathologists around the world are urging governments to restrict viewing and handling of the body in routine after examination is complete. During the Ebola epidemic – which claimed around 11,300 lives in West Africa between 2014 and 2015 – handling of the dead was one of the main modes of transmission of the disease. So one of the lessons forensic humanitarians took from this experience which is now being applied to coronavirus was that untrained first responders should not be involved in handling human remains during outbreaks of highly contagious diseases.

DISCUSSION

A well known international figure in his speech said that the World is preparing for Nuclear war and is not really ready for a pandemic outbreak. Speculation had their feet since quite some time that if there will be another world war, bio weapons can have a very significant role. He specifically mentioned that countries need to invest more in health care than on the armies. His prediction came true in less than 5 years, even the most powerful of nations are struggling to deal with their weakened health care system and lack of both manpower & machines. A vaccine against the same is still a distant dream. As we are writing down this article scientists are suspecting two strains of COVID-19 Virus, a more independent and aggressive combination of forensics and virology many solve the mystery of why some countries are more effected and why some less ?, why few countries are facing higher mortality rate and why few less ? And above all the biggest question is COVID-19 a real bioweapon putting the world into third world war without even lift of a gun ? Forensic epidemiology has been used for many years in the courtroom, and public health and law enforcement have conducted joint investigations of many health related criminal events. The magnitude of terrorist events occurring since September 2001 has increased our attention to these types of events. It is important to educate public health and law enforcement on the ways in which each other conducts investigations and the ways in which the disciplines can work together to secure the public's health. Forensic autopsy is currently the main way to identify and accumulate systematic pathological information for death cases. Examination agencies should fully record and maintain the basic information for COVID-19 patients (name, age, sex, place of origin, place of residence, place of onset and travel history), information from the anatomical examination and epidemiological and clinical data. Feedback on pathology examination reports or the identification opinion of the cause of death should be timely sent to related medical institutes,

disease prevention control agencies and health administration departments.

Conclusion

Forensic Virologist provide a framework for optimising specimens collected and guidance on interpretation of results for common infections encountered , as well as the role of autopsy in identifying emerging infectious diseases and bioterrorism threats. They also provide a perspective on the unique and hidden challenges of handling a Pandemic

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