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TB-PACTS: A fresh emphatic data sharing approach

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ABSTRACT

Tuberculosis (TB) is a leading dreadful tropical disease which causes 1.5 million mortalities per year and nearly one-third of all TB cases are unreported annually. Keeping in view of the therapeutic properties of mycobactericidal agents, at present there are 20 new diagnostic test platforms, 4 anti-tubercular agents in Phase III, 7 in Phase II clinical trials, 5 in preclinical development and 3 mycobactericidal agents in Good Laboratory Practice toxicity evaluation. The End TB Strategy of World Health Organization paved a way to aggregate clinical trials reports in a unique platform. The neoteric introduction of TB-Platform for Aggregation of Clinical TB Studies (TB-PACTS) showed a great white hope of the scientific community which would ultimately benefit TB patients. In fact, TB-PACTS is an extremely important tool to combat TB by making clinical trials data easily available. The present study summarized not only the concise current status of TB but also substantial glimpse of TB-PACTS recently launched in a nutshell.

1. Introduction

Tuberculosis (TB), a deadly infectious disease caused by *Mycobacterium tuberculosis* (Mtb), is a leading cause of mortality and public health threat worldwide. According to the latest report of World Health Organization[1], the total count for new TB cases estimated was increased globally as compared to that in last few years. The study also estimated that 9.7% of the total patients with multidrug-resistant tuberculosis (MDR-TB) were found to have extensively drug-resistant tuberculosis in 105 countries. Recently, the emergence of Mtb resistant to all anti-tubercular drugs was reported, which was termed as totally drug resistant tuberculosis (TDR-TB)[2].

In order to develop new anti-tubercular drugs and antibiotics, several antimycobacterial agents are under clinical trials not only for their potentiality in the treatment of TDR-TB but also for shortening the duration of existing TB therapy. Few drugs are currently undergoing phase III clinical trials in order to evaluate the safety and efficacy of these anti-tubercular drugs. Out of these anti-tubercular drugs under clinical trials, 4 are in Phase III trials, 7 are in Phase II, 5 are in preclinical development and 3 anti-TB agents are in Good Laboratory Practice toxicity evaluation[3]. Recently, U.S. Food and Drug Administration has approved TMC207 as a part of combination therapy to treat MDR-TB[4]. At present, there are a number of anti-tubercular agents in preclinical as well as clinical development pipeline.

These clinical trials strategies include not only the existing antibiotics and developed anti-tubercular drugs but also newly identified antimycobacterial agents and compounds. Few of these drugs are effective against both MDR- and extensively drug resistant-TB. The current anti-tubercular drugs available in the market and newly developed drugs under clinical trials status show mycobactericidal activity with diverse mechanism of action. The anti-tubercular drugs act upon Mtb by inhibiting the synthesis of mycolic acids, inhibiting the protein synthesis, blocking DNA replication, interfering the synthesis of cell wall formation,

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disrupting arabinogalactan synthesis, blocking the natural enoyl-AcpM substrate, disrupting the membrane transport, inhibiting DNA synthesis, inhibiting thymine nucleotides biosynthetic pathways, inhibiting electron transport chain, disrupting the permeability of cell envelope, binding with 30S subunit of the ribosome, binding with 30S of the ribosome and targeting the DNA gyrase. In order to eradicate TB in future, it is obligatory to know the effectiveness of all drugs under clinical trials phases and provide a detailed update on those drugs in the developmental pipeline. Recently, the Critical Path Institute, the Special Programme for Research and Training in Tropical Diseases, TB Alliance, and St. George's University of London announced the launch of the TB-Platform for Aggregation of Clinical TB Studies (TB-PACTS).

2. TB-PACTS

TB-PACTS is an invaluable data sharing approach in order to combat TB[5]. In fact, it is designed to catalyze and step up TB research by curating and standardizing Phase III TB clinical trials data and making those data easily available to the scientific community. It includes demographic information, concomitant medications information, dose/concentration information, *etc,* and helps to access and analyze the data in aggregate or individual. The major benefit of this platform is informing the development of new drugs and their regimens, and paving the way for meaningful research which would ultimately benefit TB patients. Moreover, TB-PACTS is equipped to host additional trial records as well as data from additional investigations that might improve knowledge as well as the design of the future research. This is the first time clinical trials sponsors have worked together to make clinical trials data collectively available to the research community. Professor Gillespie commented: "This is an important milestone for clinical trials of tuberculosis"[5]. Thus, the clinical trials results of anti-tubercular drugs, led by researchers at the University of St Andrews, are available to the scientific community from 18 April 2016 with the launch of TB-PACT.

The important features about the TB-PACTS are described below[6].

Firstly, TB clinical trials datasets (REMoxTB, RIFAQUIN and OFLOTUB), contributed by St. George's University of London, World Health Organization and the TB Alliance, are available for qualified TB researchers.

Secondly, The data platform contains some information such as drug susceptibility data, diagnostic testing results, demographic data, HIV co-infection information, treatment adherence information, concomitant medications information, adverse event information, CD4 counts, treatment outcomes and TB symptoms.

Thirdly, before accessing the TB-PACTS, users must agree to the "terms and conditions of TB-PACTS" and submit an online application form to request access to the data platform. Besides, the TB-PACTS data platform steering committee approves data access for external users after 1 month. Moreover, the TB-PACTS is freely available for use without any charges and data ownership is always retained by the data contributor. Finally, most importantly, Critical Path Institute provides necessary guidelines for data contributors.

3. Future remarks

The TB-PACTS data platform will make TB clinical data sets available to the scientific community. Researchers would be able to analyze and conclude the clinical trials information by aggregating these reports in a single resource.

Conflict of interest statement

We declare that we have no conflict of interest.

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