

Review Article

Treatment-involved medicine: a proposed new medical sub-discipline

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Abstract: In addition to intervening the targeted diseases that were diagnosed by the clinicians, medical treatment could exert some other positive or negative effects on patients. It is necessary to initiate a sub-discipline to specially explore the additional effects caused by medical treatment. Therefore, we initiated the following proposals: i) treatment-involved effect (TIE) is defined as the other positive or negative effects caused by medical treatment in addition to treating targeted diseases, while ii) treatment-involved medicine (TIM) is defined as the corresponding medical sub-discipline to explore TIEs. In addition, we gave a checklist of TIEs to systematically evaluate the TIM. We believed that TIM will not only contribute to identifying the negative effects of treatment, but also may identify new methods of treatment, thereby enabling clinical medicine to reach higher levels of effectiveness.

Keywords: Medical treatment, treatment-involved medicine, medical sub-discipline, treatment effectiveness

Introduction

"Treatment" is defined as the attempted remediation of a health problem in patients, usually following suspected or definite diagnosis by clinicians. In addition to providing interventions for these clinician-diagnosed diseases, medical treatments may also exert positive, negative, or other effects on patients. While exploring these effects is important, so far there is no specific medical field to elaborate the additional effects caused by medical treatments. In this study, we proposed the formation of treatment-involved effect (TIE) and treatment-involved medicine (TIM) disciplines. Furthermore, we provided a checklist for TIEs to systematically evaluate TIM.

Materials and methods

Definitions of TIE and TIM

This article includes the following proposals: i) TIE is defined as the other positive or negative effects caused by medical treatment in addition to treating targeted diseases, while ii) TIM is defined as the corresponding medical sub-discipline to explore TIEs.

TIM research strategy

The TIM research strategy is based on a checklist of TIEs, which primarily consists of six sections.

Results

TIEs were divided into the following classifications: i) side effects; ii) complications; iii) positive and negative effects on other known and unknown existing diseases; iv) potential or long-term effects on the human immune system, chromosomal, genome or other respects; and v) effects on cost-effectiveness, psychology, sociology, psychology, economics, ethics, and other respects. Furthermore, a checklist based on these factors was included in order to systematically evaluate TIMs (**Table 1**).

Discussion

In current clinical practice, clinicians primarily pay attention to the effects of medical treatment on the targeted diseases and complications and side effects, and are less concerned about the other effects described previously.

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Table 1. Treatment-involved Effects Checklist

Section/Topic	Checklist Item	Report
Side effects	Morbidity, mortality, and other adverse risks caused by treatment	
Complications	Foreseen, common, and rare complications caused by treatment	
Positive effects on other diseases	Other known and unknown existing diseases	
Negative effects on other diseases	Other known and unknown existing diseases	
Potential or long-term effects	Human immune system, chromosomal, genome, and other effects	
Other effects	Cost-effectiveness, psychology, sociology, praxiology, economics, ethics, and other effects	

Although the aim of treatment is usually to cure or improve a targeted disease, treatments can affect the whole body. Therefore, a treatment has potential, unexpected, and long-term effects. For example, thalidomide has been used to treat nausea and alleviate morning sickness in pregnant women. After the drug was used in Germany, it was confirmed to cause phocomelia in infants [1-3]. The negative effects of thalidomide led to the development of more structured drug regulations and control over drug use and development.

Medical therapy may also have disadvantageous effects on other existing diseases. For example, oral isoniazid for treatment of tuberculosis might exacerbate chronic active hepatitis [4-6], and perioperative blood transfusion has been shown to increase the risk of tumor recurrence [7, 8].

In addition, medical treatments may also exert positive effects on other complicated diseases. Some cases are common, but easily overlooked. For example, antibiotic use for treatment of *Helicobacter pylori* infections may improve periodontitis in patients [9-11].

Interestingly, some anti-arrhythmia drugs may cause onset of new arrhythmias [12-14]. However, there have also been unexpected effects, such as gastric bypass surgery for treatment of type II diabetes. This discovery was accidental. Gastric bypass surgery was originally used for treatment of obesity in clinical practice [15-17]. However, clinical findings revealed that some obese patients complicated with diabetes mellitus II improved significantly, and could be maintained on reduced amounts of insulin [18-21]. The International Diabetes Federation and European Diabetes Research Council have approved the use of gastric bypass surgery for treatment of type II diabetes. In 2009, the American Diabetes Association also recommended this as a con-

ventional treatment for type II diabetes. Another well-known example is the discovery of sildenafil (sold as Viagra and other trade names). The original aim of the drug clinical trials was to develop a new treatment against hypertension; however, sildenafil has also been confirmed to treat erectile dysfunction. It has become a primary medication for erectile dysfunction [22-26].

In addition, the effects of medical treatment on sociology, psychology, economics, ethics, and other aspects should not be ignored. The technological revolution led to advances in medical technology, medical treatment has become more diversified, complex, and intelligent. Medical treatments have increased life expectancy; however, these advances have also resulted in increased need for significant resources and in emergence of social and other problems. In recent years, a number of controversial new medical technologies such as cloning, euthanasia, and organ transplantation have emerged. Their impacts on social customs, psychology, economics, ethics, and other aspects require further identification and exploration.

Thus, not only should we pay attention to the treatment of the targeted diseases, but also should we concern about TIEs. It is necessary and important to put forward a new medical sub-discipline, TIM, for the comprehensive evaluation of medical treatment. In future, scholars should focus on and systematically explore TIM in collaboration with multiple disciplines and perspectives, on the basis of evidence-based medicine. This article provides a preliminary checklist of TIEs to systematically evaluate TIM. However, further executable checklist protocols should be developed in order to implement TIM research strategies. We believed that TIM will not only contribute to identifying the negative effects of treatment, but also may identify new methods of treatment, thereby enabling

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clinical medicine to reach higher levels of effectiveness.

Disclosure of conflict of interest

None.

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