



PROGRESS IN THE DIAGNOSIS AND TREATMENT OF KAWASAKI DISEASE AND OTHER MULTI-SYSTEM INFLAMMATORY SYNDROMES BY ARTIFICIAL INTELLIGENCE

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Purpose. To explore the role of artificial intelligence in distinguishing Kawasaki disease from other multi-system inflammatory syndromes. **Method.** We refer to the existing relevant articles at home and abroad for analysis. **Results.** The clinical application of artificial intelligence has played a time-saving and labour-saving role in the differentiation of Kawasaki disease and other multi-system inflammatory syndromes, suggesting that the application of big data in clinical practice can bring new development opportunities for medical treatment. **Conclusion.** Kawasaki disease and other multi-system inflammatory syndromes are similar and overlapping in clinical practice, which is difficult to distinguish and easy to misdiagnose and missdiagnose. Artificial intelligence is applied to analyze the above disease data, to achieve the effect of accurate differentiation, timely diagnosis, symptomatic treatment and reduction of complications.

Introduction. In December 2019, the first case of the novel coronavirus (COVID-19) was first reported in Wuhan, China. Later, large outbreaks spread globally, and a new syndrome, multisystemic inflammatory syndrome (MIS), with fever and cytokine release after infection with SARS-COV2, was initially considered to be an atypical form of Kawasaki disease (KD), as most of its clinical symptoms are similar to Kawasaki disease and may also lead to cardiac complications. The difference is that left ventricular insufficiency and cardiovascular shock, coagulopathy and gastrointestinal involvement are more serious in this novel syndrome than in Kawasaki disease. Kawasaki disease (KD), previously known as cutaneous mucosal lymph node syndrome, was first reported by Tamisaku Kawasaki in 1974. The disease is a systemic inflammatory disease with medium-sized vasculitis and is mainly seen in children under 5 years of age. Artificial intelligence (AI) is a technology that integrates advanced brain cognition, big data, cloud computing and machine learning based on modern medical and biomedical theories. Corresponding studies have shown that the multi-system inflammatory syndrome associated with the SARS-CoV-2 pandemic partially overlaps with Kawasaki disease (KD). For example, they all present with fever, rash, mucous involvement, conjunctivitis, erythema/edema of hands and feet, and swollen lymph nodes in the neck. The difference is that the associated lymphocytopenia observed in patients with MIS-C has been compared to the significant neutrophilism and thrombocytosis observed in KD. Other studies have found that the number of related lymphocytes observed in patients with MIS-C is decreased, while the number of neutrophils and platelets observed in KD is significantly increased. With our current knowledge reserve and medical level, KD and MIS-C cannot be judged quickly and accurately, which may make patients in emergency environment or emergency department unable to receive timely and effective symptomatic treatment. We boldly hypothesized whether some modern technologies, such as artificial intelligence, could be used to distinguish these two diseases

quickly and effectively. Therefore, the author consulted the literature on this aspect and found that there were very few literatures on the use of artificial intelligence to distinguish and study KD and MIS-C. The study is prospective, and it's worth debating whether using AI to distinguish between diseases can be accurate. It will be a cause for celebration for paediatricians if the research proves to be feasible enough to be applied to the clinic.

Content. Collecting, integrating data, defining the host immune response, using an AI-guided approach help to uncover shared host immune responses in Kawasaki disease and pediatric multisystem inflammatory syndrome, and filling in the gaps in previous studies step by step by developing and validating a computational approach with human intelligence to distinguish KD, MIS-C, and other similar febrile diseases. However, based on current studies, we still cannot accurately distinguish KD from other multi-system inflammatory syndromes effectively. Although there are many methods to distinguish MIS-C from Kawasaki disease at home and abroad, most of them are based on the clinical characteristics of the disease and laboratory test results. There are few clinical studies using artificial intelligence to distinguish MIS-C and KD. After reading and thinking about relevant literature, the problem that has been solved so far is that we can temporarily use some technologies to distinguish Kawasaki disease, MIS-C and other febrile diseases, but whether this technology is mature enough and when it can be applied in clinic remains to be investigated.

Conclusion. In conclusion, Kawasaki disease (KD) and pediatric multisystem inflammatory syndrome (MISC) are both autoimmune hyperinflammatory method in the diagnosis of these diseases.