country where virus is originated to other countries, thereby causing a global public health crisis.

Nevertheless, the development of an appropriate regimens for effectively inhibiting, treating or preventing such respiratory virus pathogens causing epidemics has been insufficient to date. As such, there is an urgent need to develop a drug for counteracting theses diseases for the health and welfare of human beings around the world.

In addition, although the clinical symptoms of their respiratory infections are somewhat similar and they belong to the same RNA virus family, there are differences according to genetic and structural levels among viruses, and it is reported that these differences affect the sensitivity and efficacy of antiviral drugs. Furthermore, these molecular-genetic differences in viruses cause differences in transmission routes, host receptors for virus binding, transmission rates, incubation periods and/or infection sites, leading to differences in clinical symptoms and therapeutic efficacy, and thus the development and application of appropriate reagent against the target virus are very important.

Also, given the rapid transmission, high mortality, and global health and economic risks caused by the respiratory infectious disease, in addition to the development of new drugs and vaccines that takes at least one to several years, it can be a very effective and cost-effective strategy to explore the possibility of preventing, improving or treating RNA virus infections, specifically coronavirus-induced respiratory diseases, based on drug repositioning of drugs whose safety has been guaranteed by previous clinical trials and practical use experience.

SUMMARY

In another aspect, there is provided a use of a therapeutically effective amount of pyronaridine or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for the prevention or treatment of a respiratory disease caused by a coronavirus infection.

In yet another aspect, the present disclosure provides a use of a therapeutically effective

amount of artemisinin or a derivative thereof in the manufacture of a medicament for the prevention or treatment of a respiratory disease caused by a coronavirus infection, wherein the artemisinin derivative is selected from the group consisting of dihydroartemisinin, artesunate, artemether and arteether.

In a further aspect of the present disclosure, there is provided a use of a therapeutically effective amount of pyronaridine or a pharmaceutically acceptable salt thereof, and artemisinin or a derivative thereof in the manufacture of a medicament for the prevention or treatment of a respiratory disease caused by a coronavirus infection,wherein the artemisinin derivative is selected from the group consisting of dihydroartemisinin, artesunate, artemether and arteether.

DISCLOSURE OF INVENTION

TECHNICAL PROBLEM

An object of the present invention is to provide use of pyronaridine or a pharmaceutically acceptable salt thereof, and/or artemisinin or a derivative thereof in the prevention or treatment of epidemic RNA virus infections.

CLAIMS

1. Use of a therapeutically effective amount of pyronaridine or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for the prevention or treatment of a respiratory disease caused by a coronavirus infection.

2. Use of a therapeutically effective amount of artemisinin or a derivative thereof in the manufacture of a medicament for the prevention or treatment of a respiratory disease caused by a coronavirus infection,
wherein the artemisinin derivative is selected from the group consisting of dihydroartemisinin, artesunate, artemether and arteether.

3. Use of a therapeutically effective amount of pyronaridine or a pharmaceutically acceptable salt thereof, and artemisinin or a derivative thereof in the manufacture of a medicament for the prevention or treatment of a respiratory disease caused by a coronavirus infection,
wherein the artemisinin derivative is selected from the group consisting of dihydroartemisinin, artesunate, artemether and arteether.

4. The use according to Claim 1 or 3, wherein the pharmaceutically acceptable salt of pyronaridine is selected from the group consisting of phosphate, sulfate, hydrochloride, acetate, methanesulfonate, benzenesulfonate, toluenesulfonate, maleate and fumarate.

5. The use according to Claim 4, wherein the pharmaceutically acceptable salt of pyronaridine is pyronaridine tetraphosphate.

6. The use according to Claim 3, wherein a weight ratio of the pyronaridine or a pharmaceutically acceptable salt thereof to the artemisinin or a derivative thereof is 10:1 to 1:10.

7. The use according to Claim 6, wherein the weight ratio of the pyronaridine or a pharmaceutically acceptable salt thereof to the artemisinin or a derivative thereof is 1:1 to 6:1.

8. The use according to Claim 7, wherein the weight ratio of the pyronaridine or a pharmaceutically acceptable salt thereof to the artemisinin or a derivative thereof is 3:1.

9. The use according to Claim 2 or 3, wherein the artemisinin derivative is artesunate.

10. The use according to any one of Claims 1 to 3, wherein the medicament further comprises at least one other antiviral agent.

11. The use according to Claim 10, wherein the other antiviral agent is selected from the group consisting of a viral replication inhibitor, a helicase inhibitor, a viral protease inhibitor and a viral cell entry inhibitor.

12. The use according to Claim 11, wherein the other antiviral agent is selected from the group consisting of ribavirin, interferon, niclosamide and a combination thereof.

13. The use according to any one of claims 1 to 3, wherein the respiratory disease caused by coronavirus infection is selected from the group consisting of Severe Acute Respiratory syndrome (SARS), Middle East Respiratory Syndrome (MERS) and Coronavirus Disease 2019 (COVID-19).

14. The use according to Claim 13, wherein the respiratory disease caused by coronavirus infection is Coronavirus Disease 2019 (COVID-19).