



SARS-CoV-2 and COVID-19 Phyto-Activity in Individuals with Hematopoietic Stem Cell Transplants

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Abstract: Background: In an earlier investigation (Adejuwon et al. (2020). Cancer Biology, Marsland Press, Volume 10, Number 3) we reported from our observations that the concentrated alcohol extract of the combination of *Philenoptera cyanescens* roots, *Ageratum conyzoides* leaves, *Moringa oleifera* leaves, *Moringa oleifera* stems, *Zingiber officinale* rhizomes, *Allium sativa* buds, *Jatropha curcas* stems, *Citrus aurantiifolia* juice and honey has anti-SARS-CoV-2 inhibitory potential on certain adult females with stage 1b cervical carcinoma. **Materials and Methods:** In this present investigation, 500 g each of *Garcinia kola* seeds, *Allium sativum* buds, *Zingiber officinale* leaves, *Carica papaya* leaves and *Azadirachta indica* leaves were separately ground and mixed. This was added to 1 Litre of the juice of *Citrus aurantiifolia* fruits. The combination was soaked in 2 Litre of absolute alcohol (Sigma-Aldrich). This was left overnight for 24 hr. The extract was filtered and concentrated to about one-sixth of its original volume in *vacuo* using a rotary evaporator (Quick fit, Rotavapor-R, Buchi, Switzerland) at 30°C under low vacuum pressure and low evaporation. 100 ml of the concentrated extract was daily given orally to n = 8 volunteer patients with hematopoietic stem cell transplants diagnosed with COVID-19 (using Real-Time Reverse Transcriptase (RT)-Polymerase Chain Reaction at the Department of Virology, University College Hospital, Ibadan, Nigeria) immediately after meal for a period of fifteen days. The patients were placed under observation. **Observations:** The symptoms of acute respiratory disease reduced gradually in six of the patients within eight days of application of oral medication. The six patients presented no symptoms of acute respiratory syndrome within and after fifteen days of oral application. **Conclusion:** The concentrated alcohol extract of the combination of *Garcinia kola* seeds, *Allium sativum* buds, *Zingiber officinale* leaves, *Carica papaya* leaves, *Azadirachta indica* leaves and *Citrus aurantiifolia* fruits was effective on the presenting symptoms of COVID-19 in certain patients with hematopoietic stem cell transplants. The bioactive constituents of the combination should be investigated with the aim of developing a vaccine or curative with the essence to eradicate SARS-CoV-2 and COVID-19.

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Keywords: SARS-CoV-2; COVID-19; Hematopoietic; Stem Cell; Transplant; Medicinal Plants

1. Introduction

COVID-19 caused by SARS-CoV-2 has become pandemic [1]. In the advent to the discovery of a therapy and vaccine for COVID-19, research has cut

across the use of medicinal plants [2, 3]. We have investigated several plants as potential therapeutic applications for the virus and the disease [4].

In this current investigation, the concentrated alcohol extract of *Garcinia kola* seeds, *Allium sativum* buds, *Zingiber officinale* leaves, *Carica papaya* leaves, *Azadirachta indica* leaves and *Citrus aurantiifolia* fruits juice was administered to patients with hematopoietic stem cell transplants diagnosed with COVID-19 with view to determining its SARS-CoV-2 and COVID-19 inhibitory potentials.

2. Materials and Methods

Identification of Plant Samples

Garcinia kola seeds, *Allium sativum* buds, *Zingiber officinale* leaves, *Carica papaya* leaves, *Azadirachta indica* leaves and *Citrus aurantiifolia* fruits were bought from Oje Market, Ibadan, Nigeria. They were identified by Professor Taiye R. Fasola of the Department of Botany, University of Ibadan, Ibadan, Nigeria. The seeds, buds, leaves and fruits were obtained and kept in cellophane bags at room temperature about 18 hr prior to start of analysis.

Extraction of Bioactive Compounds Using Alcohol

500 g each of *Garcinia kola* seeds, *Allium sativum* buds, *Zingiber officinale* leaves, *Carica papaya* leaves and *Azadirachta indica* leaves were separately ground and mixed. This was added to 1 Litre of the juice of *Citrus aurantiifolia* fruits. The combination was soaked in 2 Litre of absolute alcohol (Sigma-Aldrich). This was left overnight for 24 hr.

Concentration of Extract

The alcohol extract (after 24 hr) was filtered and concentrated to about one-sixth of its original volume in *vacuo* using a rotary evaporator (Quick fit, Rotavapor-R, Buchi, Switzerland) at 30°C under low vacuum pressure and low evaporation [3, 4].

Study Population

The study population constituted eight (n = 8) volunteer patients with hematopoietic stem cell transplants at the Division of Surgical Oncology, Department of Surgery, University, College Hospital, Ibadan, Nigeria diagnosed with COVID-19 (using Real-Time Reverse Transcriptase (RT)-Polymerase Chain Reaction) at the Department of Virology, University College Hospital, Ibadan, Nigeria.

Oral Application of Extract

100 ml of the concentrated extract was given orally to the eight volunteer patients with hematopoietic stem cell transplants diagnosed with COVID-19 immediately after meal for a period of fifteen days on a daily basis. Their consent to participate in the research investigation was obtained. Ethical approval was obtained from the Research Committee of the University College Hospital, Ibadan, Nigeria.

3. Results

Symptoms of acute respiratory disease reduced gradually in six of the patients with hematopoietic stem cell transplants within eight days of application of oral medication. The six patients presented no symptoms of acute respiratory syndrome within and after fifteen days of oral application.

4. Discussion

Statistics has revealed a significantly high incidence of morbidity and mortality with SARS-CoV-2 and COVID-19 epidemic in the United States of America [5]. Presently, cases of mortality due to COVID-19 in Nigeria, West Africa is not significant in comparison to what is observed in the United States of America, Brazil, India and Russia [6, 7].

In this research investigation, the concentrated alcohol extract of the combination of *Garcinia kola* seeds, *Allium sativum* buds, *Zingiber officinale* leaves, *Carica papaya* leaves, *Azadirachta indica* leaves and *Citrus aurantiifolia* fruits was effective on the presenting symptoms of COVID-19 in certain patients with hematopoietic stem cell transplants. The bioactive constituents of the combination should be investigated with the determination of developing a vaccine or curative for SARS-CoV-2 and COVID-19.

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