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Effective Results of an Herbal Remedies in the Treatment of Life-Threatening Viral Infections in Animals

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Abstract

Background: There is still no effective treatment for acute viral infections. Marecipe AV therapeutics, a prescription compound of various herbs, has been utilized at our clinic for many years in the treatment of viral infectious diseases and has shown therapeutic effect. In order to obtain clear evidence of efficacy a series of experimental treatments with Marecipe AV has been conducted on animals with lethal viral infectious diseases.

Methods: The oral administration of Marecipe AV has been used to treat several naturally infected viral infections with high morbidity and mortality in animals. The efficacy was measured by comparing mortality rates between treated and untreated animals.

Results: The mortality was 28.57% *versus* 100% among treated and untreated naturally infected pigs with ASF. The mortality was 0% *versus* 100% for treated and untreated cases when treatment was administered in the early presymptomatic stage.

The mortality was 39.04% *versus* 100% in treated and untreated naturally infected ducks with Avian influenza, and 0.86% *versus* 99.83% for treated and untreated ducks when treatment is given in the early presymptomatic stage. For chickens, the mortality was 4.60% *versus* 85% for treated and untreated, respectively. All surviving ducks and chickens ultimately achieved complete recovery.

For dogs with canine distemper and/or canine parvovirus, the mortality was 10.11% and 82.88% among the treated and untreated. For dogs infected with parvovirus only, the mortality was 0% for treated and 87.5% for untreated. Among dogs simultaneously infected with parvovirus and canine distemper, the mortality was 15.25% and 96.84% for treated and untreated, respectively. All surviving dogs fully recovered.

Conclusions: The findings indicate that Marecipe AV can save lives from several deadly viral infections and cure these viral infections. Marecipe AV therapeutics presents a new effective treatment Opportunity for acute viral infections.

Keywords: Viral infections; Therapeutics; Marecipe AV; Parvovirus; COVID-19

Abbreviations: ASF: African Swine Fever; TCM: Traditional Chinese Medicine

Introduction

For more than a century, numerous medical researchers have attempted to discover remedies for viral illnesses. Unfortunately, except for vaccination, no safe and efficient cure has been discovered [1,2]. Death is the sole outcome of certain acute viral infections in animals such as African Swine Fever (ASF), avian influenza, canine distemper, and canine parvovirus infections [3-16]. The recent COVID-19 pandemic has led to many deaths [17-21]. The alarming increase in respiratory viral infections, drug-resistant strains of viruses, and high rates of zoonosis indicate the need for newer technological solutions in the field of medicine [22].

Marecipe AV therapeutics is an ancient Traditional Chinese Medicine (TCM) prescription consisting of powders from three plants and insects. Marecipe AV has been utilized for treating viral infections such as influenza, HPV infection, HBV infection, herpes zoster and postherpetic neuralgia at our clinic for more than ten years. A post hoc analysis of outpatient record suggested a possible therapeutic effect of Marecipe AV on COVID-19 [23]. The previous summary showed that the average duration of fever associated with COVID-19 was less than 24 hours after the initial treatment among the 159 patients treated with Marecipe AV, compared to 103 hours in the 365 patients untreated. The COVID-19 course resolved within 48 hours in all treated patients. Among 78 patients at high risk of severe COVID-19, the mortality and hospitalization rates were both 0% among treated patients, compared to 36.36% and 68.18% in the untreated group, respectively. However, these data are derived from outpatient records rather than a well-designed and supervised clinical trial. More conclusive and robust evidence is needed to determine its antiviral effectiveness. Therefore, numerous experimental interventions have been carried out in order to confirm the effectiveness of Marecipe AV in treating naturally infected life-threatening viral infections in animals.

Materials and Methods

Study design

A variety of incurable and life-threatening viral diseases such as ASF, avian influenza, canine distemper and canine parvovirus were selected as experimental models. The efficacy of Marecipe AV in addressing these conditions was measured based on the mortality in the treated and untreated groups.

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Population

In the experimental treatment of ASF, the subjects consisted of approximately three-month-old pigs raised in virus-contaminated backyard pigpens. Infected pigs capable of self-feeding were randomly divided into treated and untreated subgroups using bamboo hedges as barriers. Pigs that had died with typical ASF symptoms were dissected to confirm the presence of pathological features consistent with ASF. Tissue samples from the deceased pigs were sent to the provincial disease control center for testing and confirmation of ASF infection. The ASF dipstick was repeatedly used throughout the experiment to assess for ASF infection, especially in pigs with asymptomatic or mild disease of ASF in an experimental setting.

In the experimental trial for avian influenza, the experimental subjects were infected chickens and ducks raised in backyard chicken houses or duck sheds. Experimental design number of infected chickens and ducks were randomly selected as the treatment group and the remainder as the control group. Chickens and ducks that had died with typical symptoms of avian influenza were dissected to confirm the presence of pathological features consistent with avian influenza. Tissue samples from the deceased chickens and ducks were sent to the provincial disease control center for testing and confirmation of an avian influenza infection. The avian influenza dipstick was repeatedly used throughout the experiment to assess for an avian influenza infection.

Regarding canine distemper and canine parvovirus infections, the primary subjects were infected dogs from two large stray dog shelters admitted to pet hospitals where they received routine supportive care and Marecipe AV therapeutic. During the period of hospitalization, each dog was subjected to multiple laboratory-confirmed virus infections. The infected dogs were randomly divided into a treatment group and a control group. However, due to the lack of informed consent, a small number of infected dogs were placed in the control group.

Procedures

Each infected pig that stopped eating due to illness received Marecipe AV immersion extract (20 grams per pig twice daily for 7 days) *via* gavage. For pigs that were able to eat, 80 grams of Marecipe AV immersion extract was mixed into the feed twice daily for 7 days. Infected chickens or ducks were treated with 0.5 grams of Marecipe AV immersion extract twice a day for 5 days through artificial gavage. In the case of infected dogs, the suggested treatment was 5 grams of Marecipe AV immersion extract per dog twice daily for 5 days *via* artificial gavage.

After administering Marecipe AV in all trials, the virus-contaminated surroundings were disinfected with Marecipe AV to prevent superinfection.

Outcomes and measures

The primary endpoints for trials targeting avian influenza, ASF, canine distemper, and canine parvovirus were death and mortality. The second endpoint was full recovery.

Statistical analysis

An analysis of variance was performed on each data set. The Tukey-Kramer multiple comparisons test was utilized for comparisons of death between treatment groups. Statistics were performed with the Statistical Package for the Social Sciences (SPSS) version 24 for Windows. A probability value ≤ 0.05 was deemed statistically significant.

Ethics

Although the treatments and drug preparations in this study were conducted in accordance with the principles and ethics of TCM, we have submitted the clinical application of Marecipe AV in humans and animals and received approval from the ethics committee. Ethics Committee Approval number: 202101; Institutional Animal Care and Use Committee Approval number: 202301.

Results

We included 30 infected pigs with ASF and with severe symptoms. Among them, 14 pigs received Marecipe AV *via* oral gavage, while 16 pigs did not. On day 15 after the first dose, 4 out of the 14 treated pigs and all 16 untreated pigs died. In contrast, all 60 pigs in different backyard pigpens from the same village died. The mortality rates of treated and untreated pigs were 28.57% and 100%, respectively. In another trial, 63 pigs in the early stages of the disease that were able to eat on their own were randomly divided into two groups. Of the 63 infected pigs, 30 received Marecipe AV immersion extract in their feed to promote self-feeding, while 33 remained untreated. On day 15 after the first dose, the mortality rates in the treated and untreated groups were 0% and 100%, respectively. By day 30 after the initial intervention, all surviving pigs in the two trials were completely healthy and were maintained for more than two months.

Three trials were conducted to assess the efficacy of Marecipe AV for avian influenza. In the first trial, some of the 2700 ducks in a backyard duck farm were positive for avian influenza antigen. Among them, 210 ducks with symptoms of avian influenza were randomly selected as treatment group and received Marecipe AV *via* oral gavage. On the 10th day after the initial dose, all approximately 2,490 ducks as untreated group died, while only 82 out of the 210 treated ducks died. The mortality rates were 39.04% and 100% for treated and untreated ducks, respectively. All surviving ducks resumed drinking and eating within 3 to 5 days after the initial dose of Marecipe AV and achieved complete recovery within 7 to 10 days. In the second trial, at an avian influenza-contaminated backyard farm, some of the 2000 ducks were positive for the antigen and exhibited symptoms. Among them, 230 infected ducks without obvious symptoms of avian influenza were given Marecipe AV *via* oral gavage. Seven days after the initial dose, 228 out of the 230 treated ducks survived, while only 3 out of the approximately 1750 untreated ducks survived. The mortality rates of the treated and untreated groups were 0.86% and 99.83%, respectively. All surviving ducks were fully healthy on the 20th day after the initial dose. For the chicken trial, 190 chickens from a backyard farm were included. Among them, 130 were given Marecipe AV *via* oral gavage, while 60 served as controls. Twenty chickens displaying symptoms of avian influenza were evenly divided into treatment and control groups. On day 7 after the first dose, 124 out of 130 treated chickens and 9 out of 60 untreated chickens survived. Approximately 600 chickens in different chicken houses within the same village died from avian influenza during the same period. The mortality rates for the treated and untreated groups were 4.6% and 85%, respectively. The surviving chickens were in good health on the fifteenth day after the initial dose.

Concerning canine distemper and/or canine parvovirus, 200 dogs were admitted to several animal hospitals. All dogs were positive for the virus based on PCR and dipstick tests. Out of the 200 dogs, 89 received Marecipe AV, and 111 did not receive Marecipe AV. Among the 89 treated dogs, 20 received Marecipe AV alone without antiviral therapy or adjuvant support therapy. The mortality rates were 10.11% and 82.88% in the treated and untreated groups, respectively. Among

the 46 dogs with parvovirus alone, no deaths occurred among the 30 dogs treated with Marecipe AV, whereas all 14 untreated dogs died. The mortality rates in the treated and untreated groups were 0% and 87.5%, respectively. Among dogs infected with canine distemper virus coinfected with parvovirus, the mortality rates were 15.25% (9/59) and 96.84% (92/95) in the treated and untreated groups, respectively. There were no deaths among the 20 dogs receiving Marecipe AV without conventional antiviral therapy or supportive therapy. All 9 canine deaths were caused by severe spasticity due to canine distemper. Thirty days of treatment with Marecipe AV did not resolve spasticity in these dogs but successfully cured spasticity in another 15 dogs during the same period. The diarrhea and bloody stools of all dogs with canine distemper or parvovirus, including those who ultimately died from severe spasticity, were cured within 3 days after the initial intervention. Dogs receiving early treatment usually recovered within 5 days, whereas dogs with prolonged disease recovered within 10 days of the initial dose. All surviving dogs were assessed to be healthy on the fifteenth day after the initial treatment. The mortality rates of animals treated and untreated with Marecipe AV is summarized in Table 1.

Mortality	Treated	Untreated
Administered for ASF at an early stage of the disease	0%	100%
Administered for ASF at the advanced stage of the disease	28.57%	100%
Administered for avian influenza in ducks at an early stage of the disease	0.86%	99.83%
Administered for avian influenza in ducks at the advanced stage of the disease	39.04%	100%
Avian influenza in chickens	4.60%	85%
Canine distemper and canine parvovirus	10.11%	82.88%
Canine parvovirus	0%	87.50%
Canine parvovirus combined with canine distemper	15.25%	96.84%

Table 1: The mortality rates of animals treated and untreated with Marecipe AV in ASF, avian influenza, parvovirus infection, and canine distemper.

Discussion

There is a consensus among medical scientists that it is impossible to save lives from life-threatening viral infections and cure these viral infections. The efficacy of Marecipe AV as an herbal therapy must be substantiated by incontrovertible evidence, given the absence of a cure for acute fatal viral infections. Currently, there is no curative treatment available for infections such as African swine fever, highly pathogenic avian influenza, canine distemper, and parvovirus infections. Spontaneous recovery in afflicted animals is rare, and death is the only outcome of these diseases [3,5,6,8,12,13]. When these fatal infectious diseases are used as experimental animal models, with death serving as the clear judgment endpoint, changes in mortality rate could provide compelling evidence of drug efficacy.

The findings revealed a significant disparity in mortality rates between Marecipe AV-treated and untreated animals with life-threatening viral infections, such as ASF, avian influenza, canine distemper, and canine parvovirus. The dramatic reduction in mortality indicates that Marecipe AV has therapeutic efficacy in several viral diseases and can save lives from these deadly viral infectious diseases. Marecipe AV herbal remedies have significantly reduced mortality rates from 100% to zero for fatal viral infections, providing clear evidence of their effectiveness in treating such conditions. The results showed that all surviving animals fully recovered, underscoring the therapeutic effects of Marecipe AV on these fatal viral infections and confirm that Marecipe AV may rapidly cure these life-threatening viral infections.

Marecipe AV has exhibited benefits against a variety of different types of viral infections, including ASF virus (a complex DNA and double-stranded DNA genome virus), avian influenza virus (negative-sense RNA virus), canine parvovirus (single-stranded DNA genome virus), canine distemper virus (single-stranded DNA genome virus), and SARS-CoV-2 (single-stranded positive-sense RNA virus). This suggests that Marecipe AV possesses a broad spectrum of antiviral activity and this antiviral effect may be cross-species.

Our findings demonstrated that early treatment with Marecipe AV has an almost 100% cure rate for highly lethal viral infections. However, it displayed limited effectiveness on persistent severe tics caused by canine distemper, even in the early stages. All fatalities occurred in dogs with canine distemper, suggesting that Marecipe AV did not exert a therapeutic effect on persistent severe tics. However, Marecipe AV demonstrated curative effects on some other dogs with severe tics caused by canine distemper. Regrettably, no distinctions were observed between cured and uncured dogs with severe tics.

The efficacy of Marecipe AV seems to be unaffected by antiviral treatment or supportive care, as shown by the lack of deaths among dogs treated with Marecipe AV alone, without any additional antiviral drugs or supportive treatment. Marecipe AV has been used to decontaminate virus-contaminated environments in this study; however, its effect remains uncertain.

The mechanism by which Marecipe AV treats viral diseases remains unknown. The results showed that febrile and severe diarrheal symptoms were completely reversed within 24 hours after the administration of Marecipe AV in a significant number of dogs infected with canine parvovirus and canine distemper. This finding suggests that the target of Marecipe AV may not be viral clearance but rather other sites, as viral clearance typically takes time and symptom resolution should not occur rapidly. Unpublished *in vitro* experimental studies have demonstrated that the Marecipe AV extract exhibited minimal inhibitory effects on SARS-CoV-2, despite displaying activity against HBV, HPV, influenza virus, and rabies virus. Meanwhile, Marecipe AV has been observed to demonstrate significant therapeutic efficacy against Covid-19 in clinical practice. The main chemical components of Marecipe AV, including betaine, rosmarinic acid, isoorientin, and linolenic acid, were identified through mass spectrometry (Table 2). The components were not associated with viral suppression based on the literature. These observations suggest that the primary mechanism of action of Marecipe AV may be linked to the inflammatory response or immune response rather than solely viral inhibition or clearance.

S.no	Name	Molecular formula	Relative content (%)
1	Betaine	$C_5H_{11}NO_2$	22.346
2	Rosmarinic acid	$C_{18}H_{16}O_8$	17.416
3	Isoorientin	$C_{21}H_{20}O_{11}$	11.414
4	Linolenic acid	$C_{18}H_{30}O_2$	8.827
5	Caffeic acid	$C_9H_8O_4$	4.542
6	Cichoric acid	$C_{22}H_{18}O_{12}$	4.342
7	Sucrose	$C_{12}H_{22}O_{11}$	4.083
8	Vizenin III	$C_{26}H_{28}O_{14}$	2.3
9	Citric acid	$C_6H_8O_7$	2.02
10	Azelaic Acid	$C_9H_{16}O_4$	1.826…etc

Table 2: The composition of Marecipe AV was measured by mass spectrometry.

Conclusion

Marecipe AV, a Traditional Chinese Medicine (TCM) prescription, shows promising efficacy in treating life-threatening viral infections in animals, including ASF, avian influenza, canine distemper, and canine

parvovirus. The study highlights significant reductions in mortality rates and rapid recovery in treated animals compared to untreated controls. The results suggest Marecipe AV's broad-spectrum antiviral potential. Further research is needed to fully understand its mechanisms and confirm its effectiveness through well-designed clinical trials. Marecipe AV holds promise as a valuable addition to antiviral therapies in veterinary and possibly human medicine.

Limitations

This study is subject to several limitations. Concerning ASF, the experimental animals did not receive adequate doses of the drug due to poor administration, biasing the results. Similarly, regarding avian influenza, a significant number of deaths occurred within 6 hours after the initial dose, suggesting that this interval was not sufficient for drug absorption and effects, indicating inappropriate timing for the first dose and biasing the experimental results.

The trials for ASF and highly pathogenic avian influenza were conducted in two sections. In the ASF trial, artificial gavage was necessary because the pigs did not eat. However, the lack of equipment for immobilization made artificial gavage challenging, and the researchers believed that all pigs did not receive adequate doses of the drug, possibly biasing the results. In the highly pathogenic avian influenza trial, most deaths occurred within 6 hours after administration, indicating that the drug may not have achieved its efficacy at the time of death. Thus, two experiments involving early drug administration were conducted. The results showed that the timing of the initial intervention and adequate drug doses significantly affected mortality.

Clinical trial declaration

The study was not a clinical trial of a new drug but rather a therapeutic experiment using naturally infected animal models in real-world. Marecipe AV is a prescription compound of various herbs that has been used for hundreds of years in China and as a treatment for viral infectious diseases in our clinic for more than a decade. Prescribing formula to treat patients and animals is the routine working mode of TCM, which conforms to the routine diagnosis and treatment norms of TCM. Because most of the herbs do not have specific indications, when a TCM doctor prescribes a prescription, regardless of the type of herbal medicine in the formula, it is in accordance with the diagnostic and therapeutic standards of TCM. Therefore, this research does not a Clinical Trials of new medicine but only applied for ethical approval.

Animal ethics declaration

This study did not involve the use of experimental animals; instead, it focused on treating real-world animals naturally infected with viral infections. The live animals to be reported as described by the ARRIVE guidelines (PLoS Bio 8(6), e1000412,2010). Written informed consent was obtained from the legal guardians of all subjects (animal owners). All methods, materials and experiments were performed in accordance with relevant guidelines and regulations. The experimental procedures were approved by Institutional Animal Care and Use Committee and ethics board Tongrun Tang TCM Clinic.

The data availability declaration

The materials and datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

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