OPEN ACCESS Freely available online

Journal of Family Medicine & Medical Science Research

Short Communication

A Short Communication on Antiviral Property of Potassium Hydroxide

Emin Zümrütdal*

Department of Chemistry, General Surgeon, Volunteer Researcher, Adana, Turkey

ABSTRACT

Viral disease outbreaks, especially COVID-19, have seriously affected people. There is no specific curative treatment for viral diseases yet. Potassium hydroxide (KOH) is a very small but effective molecule that is reactive, alkaline and especially destructive to lipids. Fatal injuries associated with the accidental use of KOH have left dreaded clinical memories in humans. The antiviral activity of KOH was designed for the respiratory system and the results of the study are quite remarkable. In this study, different effects of KOH were investigated by *in vitro* and *in vivo* studies.

In the results obtained, alkalinizing, mucolytic, potential lipid destruction findings of KOH were shown. In addition, the affinities of KOH to COVID-19 spike glycoprotein, hAGE2 and Hemophilus influenza neurominidase enzyme active sites were shown. Demonstrating these findings with effective studies may create promising findings not only in viral diseases, but also in many respiratory system diseases with inflammation.

Keywords: Potassium hydroxide; Antiviral; COVID-19; Mucolytic; Alkalinization

DESCRIPTION

Viral diseases related to the respiratory system, especially caused by enveloped viruses, continue to pose a risk to public health [1]. Enveloped viruses have a lipid layer in the envelope structure, which is one of the weak points of the virus. However, the acidotic load that develops in the tissue due to inflammation and the mucus plugs formed in the respiratory tract make oxygen transport difficult in the lungs. KOH is an alkaline, surface tension lowering and reactive molecule that can interact with lipids. In this article, the study on the antiviral property of KOH is discussed [2].

Ash was inspired in the study on the antiviral property of KOH. Ash was used centuries ago by Avicenna for diseases [3]. Although ash is used in many areas, it is also used as a cleaning material (reducing surface tension) and in soap making (for alkaline effect and lipid interaction). Ash is rich in KOH content [4,5]. It is thought that these properties are achieved through KOH. Therefore, antiviral studies were continued only with KOH to prevent heavy metal poisoning.

For treatment, KOH must be transported to the lung bronchioles. For this reason, the way of administration of KOH in the study is inhaler. A solution of NaCl (8.9-9.0%) in distilled water was formed as carrier agent. The NaCl concentration in this solution is at the concentrations previously used in lung bronchial applications. The most concerned was the KOH additive. Because in some cultural uses, KOH or NaOH is used as caustic for soap making. Serious fatal esophageal injuries due to accidental use of this caustic as drinking water have created a great fear of KOH in humans [6].

In order to prevent this type of injury, but at the same time to create the highest alkalinity, the highest pH range allowed by the World Health Organization was used in drinking water (pH: 8.9-9.1). As a result, KOH was buffered to pH8.9-9.0 in distilled water containing 0.89-0.9% NaCl solution.

Of course, KOH is dangerous in high doses, but direct contact with Hipchlorous acid (HOCl) can be just as dangerous. However, we know that HOCl is made in leukocytes every day, every hour as a defense system. Could humans have life without HOCl? The important thing here is to create a safe concentration.

While examining the antiviral effectiveness of KOH, the damage that may occur from alkalinity was evaluated with *in vitro* and *in vivo* studies. *In vitro* studies have shown that KOH makes mucus more alkaline, reducing contact angle and surface tension. The fact that this mucolytic effect was also demonstrated *in vivo* in aged mice in the same study in different laboratories supports the accuracy of the findings.

Correspondence to: Emin Zümrütdal, Cukurova University, Faculty of Science and Literature, Department of Chemistry, General Surgeon, Volunteer Researcher, Adana, Turkey

Received: 16-Aug-2022, Manuscript No. FMMSR-22-18857; **Editor assigned:** 19-Aug -2022, PreQC No. FMMSR-22- 18857 (PQ); **Reviewed:** 26-Aug-2022, QC No. FMMSR-22- 18857; **Revised:** 02-Sep-2022, Manuscript No. FMMSR-22- 18857 (R); **Published:** 09-Sep-2022, DOI: 10.37532/2327-4972.22.11.125

Citation: Zümrütdal E (2022) A Short Communication on Antiviral Property of Potassium Hydroxide. J Fam Med Med Sci Res.11:125.

It is known that acidity increases the infectivity of Corona virus and H. influenza in the lung tissue, increases free oxygen radicals in diseases with inflammation in the lungs, decreases mucus fluidity, and accelerates the proliferation of cancer cells [7,8]. These values suggest that KOH may be beneficial not only in viral infections but also in many diseases with inflammation.

In the cell culture study, the fact that KOH prolongs the lifespan by 49% in 24-hour fibroblast cells confirms the considerations about the safety of the optimized pH range.

In silico studies that need to be done in the discovery of therapeutics are indispensable for current practices [9]. In the docking study, the affinity of KOH to the Coronavirus Spike glycoprotein active site, human AGE2 receptor active site, and H.influenza neurominidase enzyme active sites suggests that it will block or weaken the human cell-virus interaction. In addition, the exergonic interaction of KOH to the glycerophosphate part in the virus envelope structure suggests that KOH causes lipid damage.

One of the most important issues to be investigated in this study is the potential of KOH to cause lipid damage in human cells. Considering that a virus is much smaller than a human cell, the most important consideration for the use of KOH is thought to be KOH concentration planning.

It is a very valuable finding that histopathological findings were not found in the oral cavity and lung tissues of mice in *in vivo* experiments performed in the same studies.

In the same study, the positive shift of superoxide dismutase level with the use of KOH and the most important finding of cell damage, including the cell membrane in the lung tissue, the decrease in malondialdehyde levels with the use of KOH shows the safety of KOH inhalation optimized at pH 9.0.

CONCLUSION

In COVID-19 and other viral diseases, the causative agent may be the only one, or Hemophilus influenza virus infection or other bacterial infections may be added to this disease. Unfortunately, there is not enough curative treatment for these diseases yet. Therefore, during this period when the search for treatment continues rapidly, KOH can create an effective treatment. In the light of these findings, KOH inhalation seems to be a molecule that deserves more extensive research with its antiviral, alkaline and mucolytic activity in many diseases. The effectiveness of the KOH solution, which goes from fiction to evidence-based information, should be made reliable by clinical trials.

REFERENCES

1. Piroth L, Cottenet J, Mariet AS, Bonniaud P, Blot M, Tubert-Bitter P, et al. Comparison of the characteristics, morbidity, and mortality of COVID-19 and seasonal influenza: a nationwide, population-based retrospective cohort study. Lancet Respir Med.2021;9(3):251-259.
2. Zümürtdal E, İstifli ES, Kökbaş U, Öksüz H, Yılmaz BM, Külahçı Ö, et al. Mucolitic, Alkaline and Antiviral Properties of Potassium Hydroxide.
3. Aydın B. Chapter 2: archive institutions 1. The importance of Ottoman archives in world history. Innovative Approaches in Applications in Library and Archive Institutions. 2020.
4. Babayemi JO, Adewuyi GO, Dauda KT, Kayode AA. The Ancient alkali production technology and the modern improvement: A Review. Asian. J Appl Sci. 2011;4:22-29.
5. Afrane G. Leaching of caustic potash from cocoa husk ash. Bioresour Technol.1992;41(2):101-104.
6. Lamireau T, Rebouissoux L, Denis D, Lancelin F, Vergnes P, Fayon M. Accidental caustic ingestion in children: Is endoscopy always mandatory?. J Pediatr Gastroenterol Nutr. 2001;33(1):81-84.
7. Chu VC, McElroy LJ, Chu V, Bauman BE, Whittaker GR. The avian coronavirus infectious bronchitis virus undergoes direct low-pH-dependent fusion activation during entry into host cells. J Virol.2006;80(7):3180-3188.
8. Caffrey M, Lavie A. pH-dependent mechanisms of influenza infection mediated by hemagglutinin. Front Mol Biosci.2021;8.
9. Ricci CG, Netz PA. Docking studies on DNA-ligand interactions: building and application of a protocol to identify the binding mode. J Chem Inf Model.2009;49(8):1925-1935.