Sys Rev Pharm 2020; 11(3): 829 – 833
A multifaceted review journal in the field of pharmacy
E-ISSN 0976-2779 P-ISSN 0975-8453

The Effect of Ascorbic Acid in the Treatment of Patient with Herpes Zoster Virus

Laith A. Younus[1], Fadhil A. Nasser[2]
[1,2]Department of Clinical Laboratory Sciences, Faculty of Pharmacy, Jabir Ibn Hayyan Medical University, Al Najaf Al Ashraf, Iraq.

Article History: *Submitted: 18.03.2020* *Revised: 19.04.2020* *Accepted: 25.05.2020*

ABSTRACT
Herpes zoster is a virus that affect aged and those less immunized patients after primarily infection by Varicella zoster virus, it is characterized by skin vesicular eruptions with painful neuralgia in the dermatome distribution. The current therapies are anti-viral as well as analgesics and sympathetic nerve block. However, in some cases, the patients don't cure rapidly also the pain is persistent and does not respond well to those treatments. so the aim of this study is to give an oral vitamin C which can help those patients to be cured rapidly and to reduce the pain. a cohort study in which 200 patients with Herpes zoster virus have been selected from private dermatologist clinic in Al Najaf Al Ashraf in Iraq that were divided in to two groups: group (A) contain 100 patients after two weeks using normal treatment the doctor added vitamin C supplements 1500 mg/day for a period of two weeks later while group (B) contain 100 patients with normal treatment and do not uses vitamin C supplements, The serum vitamin C was estimated for both groups in different times then following up the patients' health state to show the effect of vitamin C between the two groups in number of patients cured in a detected periods and in reducing the pain. there is a significant differences ($P < 0.0001$) between the two groups A and B before and after vitamin C supplements, so that the more serum vitamin C concentration the less period for healing with less pain feeling. Vitamin C has an important role to cure the patients with Herpes Zoster rapidly and with less pain than those patients with low vitamin C concentrations.

Keywords: Herpes Zoster; vitamin C; pain; and shingles.

Correspondence:
Laith A. Younus
Department of Clinical Laboratory Sciences, Faculty of Pharmacy, Jabir Ibn Hayyan Medical University, Al Najaf Al Ashraf, Iraq.
E-mail: laith.ali@jmu.edu.iq

DOI: 10.31838/srp.2020.3.116

INTRODUCTION

Herpes zoster is caused by the recrudescence of a primary infection with the varicella zoster virus that causes chickenpox disease when the patients were cured of this primary infection, the varicella zoster virus stays latent in the root of ganglia and cranial nerve, then the reactivation of this virus can cause the typical dermatomal pain with a vesicular rash which is called shingles disease (1), as in figure 1.

Fig: 1: Real picture show the differences between Herpes and Varicella Zoster

So Shingles were caused by the same genus of virus Zoster, at the beginning Varicella which is the initial infection that causes a generalized rash, then Herpes will appear after reactivation, years later, and symptoms are usually localized to a specific dermatome (2).

More than 90% of peoples in the world have evidence of primary varicella zoster virus infection especially in Schools ages so therefore those peoples with chickenpox were at risk for reactivation and a secondary infection would have appeared. The risk of herpes zoster increases with advancing age, and with a decrease in immunity by any causes such as cancer, immune deficiency diseases, and any treatment that causes immunosuppression (3).

Herpes zoster differs from varicella zoster is not seasonal. Women and white peoples have a higher risk than males and black peoples. The post-herpetic neuralgia which is the commonest complication of herpes zoster, this pain will persist long after cutaneous healing (4). The periods of pain were depending on the time of detection of the neuralgia, the risk of postherpetic neuralgia ranges from 5% to 32% and increases with advancing in age, the pain duration also varies widely and can extend for years, although it usually resolves within months. People over 70 years are at increased risk of more persistent pain (5).

Vitamin C, which is known as ascorbic acid, is abundant in nature but it is highly labile. It is a water-soluble vitamin so

that it is lost in large quantities during life (6,7). It is an acid structure as in figure 2 (8), it's requirement was different across nations, for example, in England is 30mg/day, while in the American is 60mg/day, 100mg/day in Japan and about 1500 mg in east of Asia (9,10).

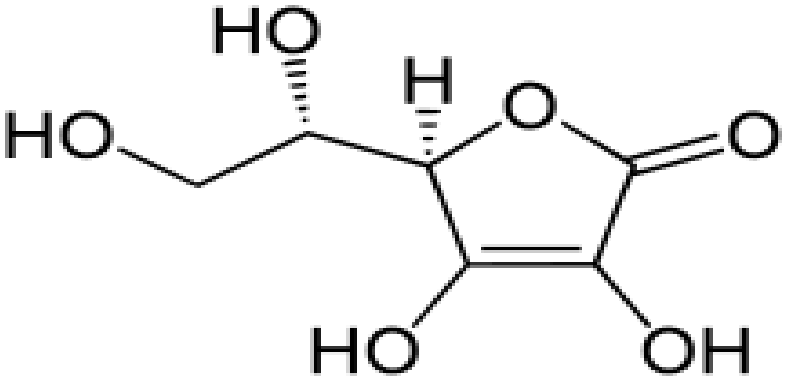

Fig: 2: Ascorbic acid structure [8]

These variations need for further research to establish the acceptable requirements for populations (11). The concentration of vitamin C should be more than the amount needed to prevent the occurrence of disease, also to be effective to treat some diseases (12,13,14). Vitamin C has an important biochemical function including the stimulation of certain enzymes, increasing immunity, biosynthesis of collagen in skins, activation of hormones, as anti-antioxidant, and has an important role in a pain reducing (1) .

Vitamin C can increase immunity by its action on the reduction of the level of stress hormones from the adrenal gland these stress hormones can suppress the immune system, high dose of vitamin C can increase the levels of an antibody that fights against viruses in humans also, the vitamin C can help in the wounds healing by its action on the synthesis of connective tissue, the major component of which is collagen, ascorbic acid has an important metabolic and biological functions, with respect to its role in the synthesis of connective tissue (15, 16) .

About the effect of vitamin C with pain a recent epidemiological evidence has indicated an association between spinal pain and suboptimal vitamin C status (1). Any pain in musculoskeletal is also a symptom of vitamin C deficiency disease scurvy, furthermore, accumulating evidence indicates that vitamin C administration can exhibit analgesic properties in some clinical conditions (5). Also vitamin C has an important functions in the body, especially through acting as a cofactor for a family of biosynthetic and regulatory enzymes. Such as the synthesis of neurotransmitters and peptide hormones, and regulation of transcription factors and gene expression (1,5).

METHODS

2.1 Study individuals

In this cohort study 200 patients with Herpes zoster virus have been selected from private dermatologist clinic in Al Najaf Al Ashraf in Iraq then they were divided in to two groups: group (A) contain 100 patients continuing on the normal treatment for two weeks then the doctor was advise them to use vitamin C supplements of 1500 mg/day for two weeks and group (B) contain 100 patients on the normal treatment for two weeks they don't use vitamin C supplements, The serum vitamin C was evaluated for both groups in different times by a method of Burtis (17) with following the patient's health state to show the effect of vitamin C between the two groups in number of patients cured in a detected periods and its effect on reducing the pain.

2.1.1. The inclusion and exclusion criteria

All the selected patients were well diagnosed by the dermatologist to have the Herpes Zoster virus, all of them do not take any vitamin C , the age of all 200 individuals were between 40 to 60 years old.

2.1.2. Statistical analysis

To analysis the data between the two groups the student T and ANOVA tests were used (SPSS Inc., Chicago, IL).

RESULTS

The clinical and biochemical characteristics of study individuals are presented in table 1

Table 1: The clinical and biochemical characteristics of study patients before vitamin C supplements

Parameters	Group A Before use Vitamin C	Group B Not use Vitamin C	P - Value
No	100	100	No diffrances
Sex (male/female)	38/62	44/56	**********
Age (years)	40-60	40-60	No diffrances
Vitamin C mg/dl	1.25 ± 0.45	2.10 ± 0.60	P < 0.0001

Table 1 shows the characteristics features of the two groups before taking a vitamin C supplements the number and the ages of patients are identical in both groups while the concentration of vitamin C were higher in group B than Group A.

Table 2: The clinical and biochemical characteristics of study patients after two weeks of normal treatments

Parameters	Group A (not cured) before use Vitamin C	Group B (not cured) not use Vitamin C	P - Value
No	95	68	P < 0.0001
Sex (male/female)	35/60	24/44	**********
Age (years)	40-60	40-60	No diffrances
Vitamin C mg/dl	0.98 ± 0.15	1.85 ± 0.43	P < 0.0001

Table 2 show a decrease in level of Vitamin C in the serum for both groups the Herpes Zoster in group B was begin to cure more than in group A with less pain,

Table 3: The clinical and biochemical characteristics of study patients after addition of vitamin C 1500 mg/day for two weeks for group A only

Parameters	Group A (cured) before use Vitamin C	Group B (cured) not use Vitamin C	P - Value
No	95	2	P < 0.0001
Sex (male/female)	35/60	22/44	**********
Age (years)	40-60	40-60	No diffrances
Vitamin C mg/dl	5.25 ± 1.15	0.75 ± 0.12	P < 0.0001

Table 3 show an increase in the level of vitamin C in the serum of group A while a decrease in vitamin C in group B the Herpes Zoster in group A was cure completely 100% with no pain rather than in group B which they were begin to cure firstly.

Table 4: The differentiation between the two groups A and B in relation to number of patient that cured in a known period and in the pain felling in patients with Herpes Zoster after two weeks of normal treating.

Parameters	Group A Before use Vitamin C	Group B Before use Vitamin C	P-Value	Percent of patients curing from *Herpes Zoster* Group A after 2 weeks from normal treatments	Percent of patients curing from *Herpes Zoster* Group B after 2 weeks from normal treatments	P value	Pain felling
No	100	100	No differences	5/100 (5%)	32/100 (32%)	P < 0.0001	Group B less pain than group A
Sex (male/female)	38/62	44/56	**********	3/2	20/12	**********	**********
Age (years)	40-60	40-60	No differences	40-52	40-55	No differences	**********
Vitamin C mg/dl	1.25 ± 0.45	2.10 ± 0.60	P < 0.0001	0.98 ± 0.15	1.85 ± 0.43	P < 0.0001	**********

Table 4 show the P-Value between the two groups after two weeks treatments before taking vitamin C supplements in which there was a significant increase in the concentration of vitamin C in group B than in group A that lead to significant increase in patients curing with less pain than group A.

Table 4 show the p-Value between the group A and B after taking 1500 mg /day of vitamin C supplements to group A so there were a significant increase in the concentration of vitamin C in group A that lead to cure all the patients in group A without felling of pain rather than group B that the patients need a time to cure in addition to the increase in pain felling.

DISCUSSION

The role of vitamin C is very important in many diseases (12), one of the most important diseases that can affect peoples is shingles disease that caused by Herpes Zoster that can

causing skin vesicular eruptions with painful neuralgia in the dermatome distribution (1), in table 1 the vitamin C was evaluated in the two groups showing that group B have the highest vitamin C concentration the reason is due to the types of food that group B were used, after a list of question in the questionnaire sample shown that those group were depend on fruits and vegetable in large quantities due to their habitat in the rural region whose depend on fruit and vegetable in their diet which is considered a good source for vitamin C (18).

After two weeks from normal treatments (acyclovir, and pain killer drugs) the vitamin C in group A was depleted due to lose of healthy food and supplements in those group instead of that vitamin C in group B is also decrease but still around normal level than in group A as a result the patients were cured in a significant number than those of group A with less pain , now the very important question is why, the answer is the role of vitamin C in skin health (19,20) reducing pain (21) increasing of immunity (15) and anti-oxidants agents (14) all these roles are effective factors to patients with Herpes Zoster (2).

After addition of vitamin C supplements 1500 mg /day recommended dose for adults (22) for about two weeks to the group A only the results is curing of all patients without pain but only two patients were cured from group B these results are attributed to the concentration of vitamin C that was significantly increased in group A rather than group as in tables 2 and 5 these results were identical with the results of Sung H. 2011 (1), Levin M. 2010 (2) and Min S. 2016 (23).

Finally, this study show the effect of vitamin C in treatment the patients with Herpes Zoster and pain was more effectively controlled in the vitamin C treatment group than in the other group.

CONCLUSION

The final conclusion from this study was shown that vitamin C has an important role in treatment of shingles disease that caused by Herpes Zoster, it must be used in concomitant with antiviral and pain killer drugs for those patients to increase immunity, accelerate the healing and reducing the pain

ACKNOWLEDGEMENT

I would like to thanks Dr. Abass AlGhrebawi for his helping me in the diagnosis of patients with Herpes Zoster, a special thanks to all my sample individuals that allow me to perform this study wishing them health life forever.

REFERENCES

1. Sung Hye Byun, MD, and Younghoon Jeon, MD. Administration of Vitamin C in a Patient with Herpes Zoster - A case report - Korean J Pain June; Vol. 24, No. 2: 108-111. 2011.
2. Levin MJ, Gershon AA, Dworkin RH, Brisson M, Stanberry L. Prevention strategies for herpes zoster and post-herpetic neuralgia. J Clin Virol; 48, S14-9 2010.
3. Arvin A. Aging, immunity, and the varicella-zoster virus. N. Engl J Med; 352: 2266-7, 2005.
4. Opstelten W, McElhaney J, Weinberger B, Oaklander AL, Johnson RW. The impact of varicella zoster virus: chronic pain. J Clin Virol. 48(Suppl 1):S8–13, 2010.
5. Katz J, Cooper EM, Walther RR, Sweeney EW, Dworkin RH. Acute pain in herpes zoster and its impact on health-related quality of life. Clin Infect Dis.;39(3):342–8, 2004.
6. Basu TK. Vitamin C-aspirin interactions. Int J Vitam Nutr Res Suppl.23:83–90, 1982.
7. Jialal I, Vega GL, Grundy SM. Physiologic levels of Ascorbate inhibit the oxidative modification of low density lipoprotein. Atherosclerosis. 82: 185-191, 1990.
8. British national formulary : BNF 76 (76 ed.). Pharmaceutical Press. p. 1049, 2018.
9. Dietary Reference Intakes for Japanese 2010: Water-Soluble Vitamins Journal of Nutritional Science and Vitaminology (59):S67-S82, 2013.
10. Overview on Dietary Reference Values for the EU population as derived by the EFSA Panel on Dietetic Products, Nutrition and Allergies. 28, 2017.
11. Combs GF. The Vitamins, Fundamental Aspects in Nutrition and Health (2nd ed.). San Diego, CA: Academic Press. pp. 245–272, 2001
12. Harrison FE. "A critical review of vitamin C for the prevention of age-related cognitive decline and Alzheimer's disease". Journal of Alzheimer's Disease. 29 (4): 711–26, 2012.
13. Rosenbaum CC, O'Mathúna DP, Chavez M, Shields K (2010). "Antioxidants and anti-inflammatory dietary supplements for osteoarthritis and rheumatoid arthritis". Alternative Therapies in Health and Medicine. 16 (2), 2010.
14. Mathew MC, Ervin AM, Tao J, Davis RM. Antioxidant vitamin supplementation for preventing and slowing the progression of age-related cataract. The Cochrane Database of Systematic Reviews. 6, 2012.
15. Marcus SL, Dutcher JP, Paietta E, Ciobanu N, Strauman J, Wiernik PH, Hutner SH, Frank O, Baker H. Severe hypovitaminosis C occurring as the result of adoptive immunotherapy with high-dose interleukin 2 and lymphokine-activated killer cells. Cancer Res. 47(15):4208–12, 1987.
16. Schorah CJ, Downing C, Piripitsi A, Gallivan L, Al-Hazaa AH, Sanderson MJ, et al. Total vitamin C, ascorbic acid, and dehydroascorbic acid concentrations in plasma of critically ill patients. Am J Clin Nutr. 63: 760-5, 1996.
17. Burtis CA, Ashwood ER.Tietz. Text Book of Clinical Chemistry. 3rd ed. Philadelphia WB SAUNDERS. 1999; 45.
18. Sinha, Nirmal; Sidhu, Jiwan; Barta, Jozsef; Wu, James; Cano, M. Pilar. Handbook of Fruits and Fruit Processing. John Wiley & Sons. 2012.
19. Traikovich SS. Use of Topical Ascorbic acid and its effects on Photo damaged skin topography. Arch Otorhinol Head Neck Surg. 125:1091. 1999.
20. Farris PK. Cosmetical Vitamins: Vitamin C. In: Draelos ZD, Dover JS, Alam M, editors. Cosmeceuticals. Procedures in Cosmetic Dermatology. 2nd ed. New York: Saunders Elsevier; pp. 51–6. 2009.
21. The American Society of Health-System Pharmacists. Archived from the original on December 30, 2016. Retrieved December 8, 2016.

22. Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington, DC: The National Academies Press. pp. 95–185. from the original on September 2, 2017.
23. Min Sung Kim, Dong Jin Kim, Chan Ho Na, Bong Seok ShinA Study of Intravenous Administration of Vitamin C in the Treatment of Acute Herpetic Pain and Postherpetic NeuralgiaAnn Dermatol Vol. 28, No. 6, 2016