



Letter to the Editor

Our clinical evidence on infected burn wound healing with the bacteriophages-future revolution on the horizon

Sudhir Singh^{1,*}

¹Dept. of Plastic Surgery, Getwell Hospital, Varanasi, Uttar Pradesh, India



ARTICLE INFO

Article history:

Received 02-10-2022

Accepted 08-11-2022

Available online 26-11-2022

Keywords:

Bacteriophages

ABSTRACT

Done a lot of cases successfully in our place with bacteriophages in small nonhealing chronic wounds but its use in extensive infected burn wound healing is also encouraging. Our clinical evidence of topical application of bacteriophages on extensive multi-drug resistant [MDR] bacterial infected burn wounds has been done for the first time and has never been reported in the literature. The medical revolution is on the horizon for treating superbugs and their positive effect on the economy especially in treating skin wounds.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

Respected Sir,

Done a lot of cases successfully in our place with bacteriophages in small nonhealing chronic wounds but its use in extensive infected burn wound healing is also encouraging. In fact, our clinical evidence of topical application of bacteriophages on extensive multi-drug resistant [MDR] bacterial infected burn wounds has been done for the first time and has never been reported in the literature.

Isolation of bacteriophages is obtained from about 100 ml of water specimens from river Ganga, hospital sewage and ponds in the lab. The purified phages at a concentration of 10 to power 9 CFU/ml of bacteriophages which are suspended in normal saline and is used in topical wound infection.

The use of antiseptics like betadine, spirit, chlorhexidine, etc. is forbidden as it is detrimental to bacteriophages. After washing with normal saline, sterilized gauze pieces soaked with bacteriophages was applied on the wound surface topically. According to culture customized bacteriophages were prepared and some times cocktail of bacteriophages

were used. Bacteriophages were supplied in sterilized falcon tubes and stored in freezer for long time without losing potency. The topical application of a maximum of a 50 ml of 1x10 to power 5 CFU/ml of bacteriophages were used on resistant infected wounds on alternate days. We used customized bacteriophages prepared and filtered in the department of microbiology for culture resistant bacteria.¹ No debridement or slough removal was done and slowly with time, necrotic slough disappeared with healing power of bacteriophages. During application, there was no evidence of a sudden rise in leucocytosis, fever or other adverse side effects. After every two weeks, blood levels of bacteriophages were determined, and a concentration of 1 × 10⁵ CFU/mL was found.

All wounds irrespective of size healed [Figure 1]. The absence of significant scarring and formation of contracture without plastic surgical skin grafting may be attributed to anti-inflammatory and immunomodulatory properties of bacteriophages in spite of long duration of 4 to 5 months of conservative topical treatment.²

The advantages of bacteriophages over antibiotics is quick, simple and inexpensive isolation. Bacteria becoming resistant to it is ten times less than to antibiotics. It is specific

* Corresponding author.

E-mail address: s.sulekha@gmail.com (S. Singh).



Fig. 1: Bacteriophage healed the MDR infected burn wound in 5 months

to pathogens, and resistance usually develops after 3 weeks, but there are at least more than 600 bacteriophages for one bacteria. They don't affect human cells and so safe.^{3,4}

Bacteriophages is going to bring Medical revolution for treating superbugs and will have positive effect on economy creating huge global social impact.⁵

Acknowledgement

I am really thankful to Sulekha Singh, Gopal Nath and Rajesh Kumar for providing necessary help.

Conflict of Interest

None.

References

1. Patel D, Bhartiya SK, Kumar R, Shukla VK, Nath G. Use of customized bacteriophages in the treatment of chronic nonhealing wounds: a prospective study. *Int J Low Extrem Wounds*. 2021;20(1):37–46. doi:10.1177/1534734619881076.
2. Cafora M, Brix A, Forti F, Loberto N, Aureli M, Briani F, et al. Phages as immunomodulators and their promising use as anti-inflammatory agents in a cfr loss-of-function zebrafish model. *J Cyst Fibros*. 2021;20(6):1046–52. doi:10.1016/j.jcf.2020.11.017.
3. Bhartiya S, Prasad R, Sharma S, Shukla VK, Nath G, Kumar R, et al. Biological Therapy on Infected Traumatic Wounds: A Case-Control Study. *Int J Low Extrem Wounds*. 2021;p. 15347346211072779. doi:10.1177/15347346211072779.
4. Aghaee L, Alikhani M, van Leeuwen W, Mojtahedi A, Kazemi S, Karami P, et al. Conventional Treatment of Burn Wound Infections versus Phage Therapy. *Iran J Med Microbiol*. 2022;16(3):186–96. doi:10.30699/ijmm.16.3.186.
5. Singh S. Clinical evidence based nano crystalline silver dressing rationality, efficacy and strategy in extensive burn patients survival. *IP Indian J Clin Exp Dermatol*. 2020;6(3):268–73. doi:10.18231/ijced.2020.054.

Author biography

Sudhir Singh, Hony. Professor Academy of Medical Specialities – IMA and Sr. Consultant Plastic Surgery

Cite this article: Singh S. Our clinical evidence on infected burn wound healing with the bacteriophages-future revolution on the horizon. *IP Indian J Clin Exp Dermatol* 2022;8(4):269-270.