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# Response of Superficial Phlebitis and Subcutaneous Oedema to Combination of Magnessiumsulphate, Heparanoid & Mupirocin: An Observational Study

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***Abstract:***
*Peripheral cannulation associated superficial venous thrombophlebitis(SVT)and subcutaneous oedema is a very common clinical occurrence in hospital settings with reported prevalence as much as 80%. Incidence risk may vary as per bore size of cannula, age, site of cannulation, transfusion of blood products and IV drug administration. Topical heparanoid ointment, magnesium sulphate dressing and mupirocin ointment has been utilized in isolation or in varying combination so far. But application of all the three agents for management of peripheral cannulation associated SVT has not been reported in the literature. Herein we present our observational study conducted in Medical College Kolkata, a tertiary care hospital in eastern India where we noted more rapid improvement of SVT related swelling and subcutaneous oedema and patient's symptoms related to it like pain following application of topical heparanoid, magnesium sulphate and mupirocin ointment simultaneously. Further double blind, placebo controlled trials are necessary to decisively prove or refute the superiority of this novel combination therapy over the conventional approaches.*

***Abbreviation****: SVT: Superficial Venous Thrombophlebitis*

***Keywords****: Superficial venous thrombophlebitis, subcutaneous oedema, peripheral cannulation, heparanoid, magnesium sulphate, mupirocin*

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## I. Introduction

Peripheral venous catheters are widely utilised in hospital wards for administering intravenous therapy. [] Peripheral venous cannulation involves placement of a vascular access device in a peripheral vein. The most common complication following peripheral venous cannulation is phlebitis and subcutaneous oedema. The reported incidence of phlebitis following peripheral venous cannulation among hospitalised patients has been as high as 80%. [2] Phlebitis refers to inflammation involving tunica intima of venous wall. Visual infusion phlebitis (VIP) scale should be used ideally at each shift for inspection of peripheral venous access sites for early detection of phlebitis. [3] Several factors have been implicated to be associated with this common complication of peripheral venous cannulation. [4] Singh et al conducted a study in Nepal which revealed incidence rate of phlebitis was linked to small gauze catheter size, age between 21 and 40 years, male sex, insertion at forearm, transfusion of blood products & IV drug administration. [5] Heparanoid ointment, a novel form of heparin, is commonly utilised as a topical application as an effective therapy for post canulation phlebitis. [6] Heparin also exhibits anti-exudative &antiphlogistic effect, which helps in alleviation of pain, promotion of tissue metabolism and healing process. [7]

Sometimes, in spite of taking all the aseptic precaution while doing peripheral cannula insertion, cannulation site may develop infection justifying use of topical antibiotics like mupirocin for treating the infected site. Mupirocin is known to be effective against many gram positive bacteria including methicillin resistant staphylococcus aureus and some gram negative bacteria as well. [8]

## II. Materials & Methods

The study involved patients admitted in the general medicine ward in Medical College and Hospital, Kolkata from 1'st August,2022 to 31'st January,2023 and who were diagnosed with peripheral cannulation

associated superficial venous thrombophlebitis. Permission was obtained from the Institutional Ethics Committee

It is very difficult to distinguish between an infected and non-infected phlebitis by just clinical examination. For expediting the process of healing of cannulation related superficial thrombophlebitis,we tried to exploit the individual benefit of magnesium sulphate, heparanoid & mupirocin by applying them in

combination to the patients admitted under our care in the ward. The sites of thrombophlebitis with minimal visual infusion phlebitis (VIP) score of two were selected for our study. We assessed the thrombophlebitic area at each session of dressing. The serial clinical assessment of superficial thrombophlebitis of twenty five patients who were subjected to topical combination therapy are being illustrated in Table 1. All the patients has been chosen in consecutive method.

**Table Showing Visual infusion Phlebitis (VIP) score of hospitalized patients during the course of topical combination therapy:**

(*highest VIP score obtained in a day has been included in the table)

(#Day of initiation of topical combination therapy has been counted as day 1)

| Serial No. | Age(years) | Gender | *VIP score | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | #Day1 | Day2 | Day3 | Day4 | Day5 | Day6 | Day7 | Day 8 |
| 1. | 22 | M | 2 | 2 | 1 | 1 | 0 | - | - | - |
| 2. | 16 | F | 4 | 4 | 4 | 3 | 2 | 1 | 0 | - |
| 3. | 52 | F | 4 | 4 | 3 | 3 | 2 | 1 | 0 | - |
| 4. | 45 | M | 4 | 4 | 4 | 3 | 2 | 1 | 0 | - |
| 5. | 65 | M | 5 | 5 | 4 | 4 | 3 | 2 | 1 | 0 |
| 6. | 70 | F | 5 | 4 | 4 | 3 | 2 | 1 | 0 | - |
| 7. | 19 | M | 4 | 4 | 3 | 2 | 1 | 0 | - | - |
| 8. | 22 | M | 3 | 2 | 1 | 0 | - | - | - | - |
| 9. | 54 | F | 4 | 4 | 3 | 2 | 1 | 0 | - | |
| 10. | 62 | F | 4 | 4 | 3 | 3 | 2 | 1 | 0 | - |
| 11. | 26 | M | 4 | 4 | 3 | 2 | 1 | 0 | - | |
| 12. | 48 | F | 5 | 5 | 4 | 4 | 3 | 2 | 1 | 0 |
| 13. | 47 | F | 4 | 4 | 3 | 2 | 1 | 0 | - | |
| 14. | 39 | M | 3 | 3 | 2 | 1 | 0 | - | - | - |
| 15. | 27 | M | 4 | 4 | 4 | 3 | 2 | 1 | 0 | - |
| 16. | 18 | F | 3 | 3 | 2 | 2 | 1 | 0 | - | |
| 17. | 60 | M | 4 | 4 | 3 | 3 | 2 | 1 | 0 | - |
| 18. | 67 | F | 4 | 4 | 3 | 3 | 2 | 1 | 0 | - |
| 19. | 54 | F | 4 | 4 | 3 | 2 | 1 | 0 | - | |
| 20. | 48 | M | 5 | 4 | 4 | 3 | 3 | 2 | 1 | 0 |
| 21. | 36 | F | 4 | 4 | 3 | 2 | 2 | 1 | 0 | - |
| 22. | 70 | M | 4 | 3 | 2 | 1 | 0 | - | - | - |
| 23. | 43 | F | 5 | 4 | 4 | 3 | 3 | 2 | 1 | 0 |
| 24. | 26 | M | 3 | 3 | 2 | 1 | 0 | - | - | |
| 25. | 59 | F | 4 | 4 | 3 | 2 | 1 | 0 | - | - |

We noticed with surprise that there seems to be much earlier improvement of appearance of phlebitis area and patient's symptoms related to phlebitis and subcutaneous oedema like pain at this combination therapy in comparison to our earlier experience with conventional treatment method with magnesium sulphate soaked gauze piece or thrombophlebitic gel alone.

## III. Conclusion

There may be some synergistic interaction in play between these three individual components that may give rise to such outcome. Further studies in this direction comprising larger number of subjects and with improved design (like a randomised controlled trial )is necessary to establish or reject the superiority of this combination based approach over the traditional approach for management of peripheral cannulation associated phlebitis.

## Acknowledgment

Consent was obtained from each of the participants for conducting the study after getting approval from the Institutional Ethics Committee (IEC). We would like to express our gratitude to our patients for their sincere cooperation. We would also like to thank the staff nurses of the ward for their supportive role.

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