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ORIGINAL RESEARCH

Study of efficacy of Chloramphenicol ophthalmic ointment as suture site prophylaxis; without other antibiotics in a tertiary care center. A Randomized Clinical trial

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ABSTRACT

Background: Chloromycetin ointment consists of 10 mg/g of chloramphenicol in plastibase 30W and soft white and liquid paraffin.Chloramphenicol has a broad spectrum of activity against Gram positive and Gram negative bacteria, rickettsias, and Chlamydia. Chloramphenicol ointment is indicated for treatment of bacterial conjunctivitis, but little evidence exists for its effectiveness in prophylaxis or treatment of wound infection. Despite this, it is regularly used in areas outside its main indication. Before our study, several of the investigating general practitioners had applied it to sutured wounds as prophylaxis against wound infection. A survey of UK plastic surgeons reported that 66% used chloramphenicol eye ointment in their practice, mainly as prophylaxis against infection. The ointment has been used as an adhesive for replacement of the nail bed.

Aim & Objective: 1.To study the efficacy of Chloramphenicol ophthalmic ointment as suture site prophylaxis.2.To study incidence of infections.

Methods: Hospital based Randomized Clinical trial. Study setting: Surgery Department of tertiary care centre. Study duration: April 2019 to April 2020. Study population: All patients who required "minor skin excision" from all body sites were eligible to participate in the study. Skin flaps and two layer procedures were recorded and included

Sample size:50

Results: Majority of study subjects belongs to age group 19-36 yrs contributing 40% followed by age group 37-54 yrs 18 cases (36%), age > 54 yrs 7 cases (14%) and age < 18 yrs 05 cases (10%) respectively. Mean age among intervention group is 36.04 with SD of 14.38 and mean age among Control group is 36.72 with SD of 14.18. Most of study participants were males contributing 27 cases (54%) and female contributing 23 cases (46%). Male:Female ratio is 1.17: in intervention group majority cases presented with Lower extremities lesion e.g 8 followed by Trunk 7, Neck and face 6 and 4 cases with Upper extremities, in control group most of cases presented with Lower extremities lesion e.g 9 followed by Neck and face 7, Upper extremities 6 and 3 cases with Trunk lesion. Incidence of wound infections in intervention (chloramphenicol) and control (paraffin) groups Incidence of infection in intervention group was 8% and in Control group was 16%.

Conclusions: Application of a single dose of topical chloramphenicol to high risk sutured wounds after minor surgery produces a moderate absolute reduction in infection rate that is statistically but not clinically significant.
Keywords: Chloramphenicol ophthalmic ointment,surgical site infection,

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INTRODUCTION

Chloromycetin ointment consists of 10 mg/g of chloramphenicol in plastibase 30W and soft white and liquid paraffin.[1 2] Chloramphenicol has a broad spectrum of activity against Gram positive and Gram negative bacteria, rickettsias, and Chlamydia. [3] Chloramphenicol ointment is indicated for treatment of bacterial conjunctivitis, but little evidence exists for its effectiveness in prophylaxis or treatment of wound infection.

Despite this, it is regularly used in areas outside its main indication. Before our study, several of the investigating general practitioners had applied it to sutured wounds as prophylaxis against wound infection. A survey of UK plastic surgeons reportedthat 66% used chloramphenicol eye ointment in their practice, mainly as prophylaxis against infection.[4]The ointment has been used as an adhesivefor replacement of the nail bed.[5]

A comprehensive Medline search found only one other study relating to the use of topical chloramphenicol ointment on wounds; this study investigated the application of chloramphenicol ointment to wounds after hip replacement.[6] The incidence of wound infection in the intervention group was reduced (4% v 8%), but the sample size was small and the results were not statistically significant. Topical ocular chloramphenicol is widely used in the United Kingdom and Australia for the treatment of conjunctivitis, but is very rarely prescribed for this indication in the United States.[7]

Some controversy previously existed about the link between aplastic anaemia and topical ocular chloramphenicol, on the basis of a small number of single case reports,[7] but two international case-control studies provided no support for this association. Although the association between ocular chloramphenicol and aplastic anaemia cannot be excluded, the risk is less than one in a million per treatment course.[8] No incidences of aplastic anaemia after dermatological application have been reported, despite widespread use.

Aim and Objectives:

1. To study the efficacy of Chloramphenicol ophthalmic ointment as suture site prophylaxis; without other antibiotics in a tertiary care center. A Randomized Clinical trial
2. To study incidence of infections.

METHODOLOGY

Methods: Hospital based Randomized Clinical trial.
Study setting: Surgery Department of tertiary care centre. Study conducted at Pankaj Hospital and Poly Clinic Udyan Road Paithan Rural Health Training Centre Paithan, Aurangabad.
Study duration: April 2019 to April 2020

Study population: All patients who required"minor skin excision" from all body sites were eligible to participate in the study. Skin flaps and two layer procedures were recorded and included

Inclusion criteria:

1. All patients who required"minor skin excision" from all body sites were eligible to participate in the study. Skin flaps and two layer procedures were recorded and included.

Exclusion criteria:

1. Patients who were already taking oral antibiotics, for whom oral or topical antibiotics were clinically indicated immediately postoperatively.
2. Who were on immunosuppressive drugs. Other
3. History of allergy to any of the ingredients of Chloromycetin ointment, and personal or family history of aplastic anaemia.
4. Loss to follow up

Sample size: 200

$$\textbf{Formula for sample size} = \frac{2^* [\, Z(\text{alfa}) + Z(1\text{-beta})\,]^2 \; ^* P \; ^* Q}{(P1\text{-}P2)^2}$$

Where P1 = clinically anticipated prevalence of complete recovery for Chloramphenicol ophthalmic ointment as **suture site prophylaxis** = 60 %

P2= Clinically anticipated prevalence of complete recovery for Placebo as **suture site prophylaxis** = 22%

P= p1 +p2 / 2 = 41 %

Q= 1 - P

Level of significance (alfa error)= 5 % (0.05)

Power of test = 80%(0.84)

25 subjects in Chloramphenicol ophthalmic ointment as **suture site prophylaxis** intervention group and 25 in Placebo as **suture site prophylaxis control group.**

Sample size = 50

Approval for the study: Written approval from Institutional Ethics committee was obtained beforehand. Written approval of Surgery department and related department was obtained. After obtaining informed verbal consent from all patients who included in the study.

Sampling technique: Convenient sampling technique used for data collection . All patients who required"minor skin excision" from all body sites were eligible to participate in the study. Skin flaps and two layer procedures were recorded and included.

Methods of Data Collection and Questionnaire:

Predesigned and pretested questionnaire was used to record the necessary information. Questionnaires included general information, such as age, sex, residential address, and date of admission. Medical history- chief complain, past history, Data on demographic profile of patient, investigation, and personal history, medical past history. The study was approved by institutional ethical committee.

Data entry and analysis: The data were entered in Microsoft Excel and data analysis was done by using SPSS demo version no 21 for windows. The analysis was performed by using percentages in frequency tables, Incidence of infection. $p<0.05$ was considered as level of significance using the Chi-square test.

RESULT AND OBSERVATION

This single blinded randomized controlled trial was conducted among 50 study subjects randomly allocated in two intervention groups, to compare effectiveness of Chloramphenicol ophthalmic ointment as suture site prophylaxis over Placebo (paraffin) among patients who required"minor skin excision" from all body sites were eligible to participate in the study. Skin flaps and two layer procedures in a Tertiary care hospital.

Table 1: Distribution of study subjects according to age

Sr.No	Age in years	Frequency	Percentage
1	< 18	05	10
2	19 to 36	20	40
3	37 to 54	18	36
4	> 54	07	14
	Total	**50**	**100**

Mean age = 36.38 Standard deviation =14.14

As shown in above table, majority of study subjects belongs to age group 19-36 yrs contributing 40% followed by age group 37-54 yrs 18 cases (36%), age > 54 yrs 7 cases (14%) and age < 18 yrs 05 cases (10%) respectively. Mean age among intervention group is 36.04 with SD of 14.38 and mean age among Control group is 36.72 with SD of 14.18.

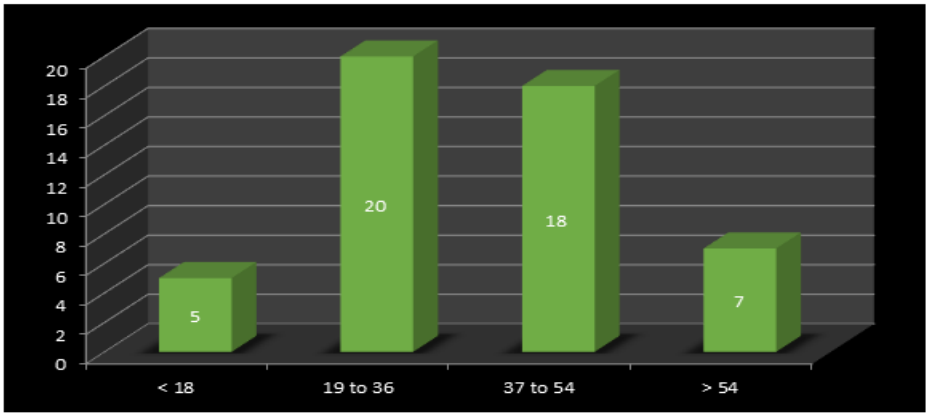

Figure 1: Distribution of study subjects according to age

Above Figure shows majority of study subjects belongs to age group 19-36 yrs contributing 40% followed by age group 37-54 yrs 18 cases (36%), age > 54 yrs 7 cases (14%) and age < 18 yrs 05 cases (10%) respectively

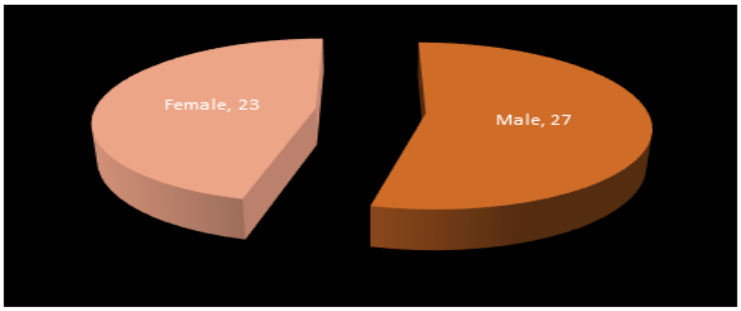

Figure 1: Distribution of study participants as per sex

As shown in above table majority of study participants were males contributing 27 cases (54%) and female contributing 23 cases (46%). Male:Female ratio is 1.17: 1

Table 2: Distribution of study subjects according to Site

Body Site	**Intervention group**	**Percentage**	**Control group**	**Percentage**
Neck and face	**6**	**24**	**7**	**28**
Upper extremities	**4**	**16**	**6**	**24**
Trunk	**7**	**28**	**3**	**12**
Lower extremities	**8**	**32**	**9**	**36**
Total	**25**	**100**	**25**	**100**

The above table shows Distribution of study subjects according to Site in intervention group majority cases presented with Lower extremities lesion e.g 8 followed by Trunk 7, Neck and face 6 and 4 cases with Upper extremities, in control group most of cases presented with Lower extremities lesion e.g 9 followed by Neck and face 7, Upper extremities 6 and 3 cases with Trunk lesion.

Table 3: Incidence of wound infections in intervention (chloramphenicol) and control (paraffin) groups

Infections	**Intervention group**	**Percentage**	**Control group**	**Percentage**
No of infections	02	8%	04	16%
Incidence of infection	8%	8%	16%	16%
Stitch abscess	3	12%	5	20%
<1 cm erythema	5	20%	7	28%
>1 cm erythema	3	12%	9	36%
Total	**13**	**52%**	**25**	**100**

The above table shows Incidence of wound infections in intervention (chloramphenicol) and control (paraffin) groups Incidence of infection in intervention group was 8% and in Control group was 16%

DISCUSSION

Some concern exists about the overuse of topical antibiotics resulting in antibiotic resistance. British and Australian guidelines suggest that use of topical antibiotics should be restricted because of the capacity of most topical drugs to select resistant micro-organisms and to cause sensitisation. The guidelines also suggest that antimicrobials recommended for topical use should be selected from classes not in use for systemic treatment. [9] A contrary argument says that the potential for antimicrobial resistance with topical antibiotics is actually lower

than with systemic antibiotics because of the higher local concentration achieved by topical delivery. [10]

Patterns of antimicrobial activity and resistance have been examined for other antibiotic ointments.[11,12] However, no evidence exists, over three decades of extensive use worldwide, to show that, with the exception of mupirocin, topical antibiotics administered on an outpatient basis contribute to any emerging resistance pattern.[10] Chloramphenicol eye drops have been shown to be effective in the treatment of meticillin resistant Staphylococcus aureus ocular surface infections.[13]

In this study Distribution of study subjects according to age shows majority of study subjects belongs to age group 19-36 yrs contributing 40% followed by age group 37-54 yrs 18 cases (36%), age > 54 yrs 7 cases (14%) and age < 18 yrs 05 cases (10%) respectively. Mean age among intervention group is 36.04 with SD of 14.38 and mean age among Control group is 36.72 with SD of 14.18. similar result is reported by Kamath S et al (2005)[6]

In current study majority of study participants were males contributing 27 cases (54%) and female contributing 23 cases (46%). Male:Female ratio is 1.17: 1.similar finding observed in Heal C et al (2006)[14]

In this study Distribution of study subjects according to Site in intervention group majority cases presented with Lower extremities lesion e.g 8 followed by Trunk 7, Neck and face 6 and 4 cases with Upper extremities, in control group most of cases presented with Lower extremities lesion e.g 9 followed by Neck and face 7, Upper extremities 6 and 3 cases with Trunk lesion. similar result found in the study conducted by Dixon AJ et al (2006)[15]

Incidence of wound infections in intervention (chloramphenicol) and control (paraffin) groups Incidence of infection in intervention group was 8% and in Control group was 16%. similar result found in the study conducted by Edwards PS et al (2004)[16]

CONCLUSION

This study suggests that application of a single dose of topical chloramphenicol to high risk sutured wounds after minor surgery produces a moderate absolute reduction in infection rate. Incidence of infection in intervention group was 8% and in Control group was 16%.

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