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"Evaluation Of Efficacy Of Homeopathic Medicine Silicea Terra In Subcutaneous Abscess In ExperimentalAnimals"

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Abstract

Background: Abscess is a common skin problem in all human beings however the standard treatment involves drainage of pus and use of antibiotics which may be painful. There is a need to develop an alternative therapy like Homoeopathy. Homoeopathic medicines are broadly used for various skin diseases involved with pus formation with gentle and permanent results; however, their preclinical assessment remains a key challenge.

Objectives: This study aimed to see the efficacy of homeopathic medicine Silicea terra in subcutaneous abscess in experimental animals.

Hypothesis: We hypothesize that all potencies of homoeopathic medicine Silicea terra shows efficacy in treating subcutaneous abscess in mice.

Methods: Homoeopathic medicine Silicea terra was used in different liquid potencies (12CH, 30CH, 200CH) against subcutaneous abscess in mice and the results were observed against standard antibiotic amoxicillin.

Results: Homoeopathic medicine Silicea terra in different liquid potencies (12CH, 30CH, 200CH) were used and it was observed that it has an antibacterial effect and also positive effect on subcutaneous abscess size, therefore it can be used in treatment of subcutaneous abscess

Conclusions: The present study reveals that Homoeopathic Medicine Silicea terra could be an effective drug in treating subcutaneous abscess.

Keywords: SILICEA TERRA , in-vivo , in-vitro, abscess, subcutaneous abscess, mice, Homoeopathy.

1. Introduction

Abscess is a collection of pus, that is formed within the tissue of the body[1]. A skin abscess is caused by pus collection in the dermis or subcutaneous tissue and manifests as a bloated, red, painful, and flocculent mass[2]. Many bacterial species can cause abscess, but gram-positive bacteria are the most frequently isolated, with the predominance being staphylococcus aureus[3]

When the local defense, such as skin cuts, hair follicle trauma, provide opportunities for bacteria invasion, especially S. aureus, it disseminates through the bloodstream enter peripheral tissues and implant infectious lesions, initially inducing inflammatory responses that attract neutrophils, macrophages and other phagocytes[3,4]. The invasion of immune cells to the site of infection is accompanied by necrosis and the discharge of pus containing staphylococci into the circulating bodily fluids. Fibrin deposits protect healthy tissues from the dispersing bacteria in defensive host responses to staphylococcal invasion.

Staphylococcus aureus disseminate onto skin surface or enter circulating, lymph and blood, which leads to formation of abscess in new sites[4].

Diagnosis is based on physical examination and can be confirmed by incision and drainage of abscess[1].

Homeopathy is a therapeutic method which is based on the Law of Similia, emphasized by Dr. Samuel Hahnemann after his experiments on Cinchona bark in 1790[5].

It now comes under the system of Complementary and Alternative Medicine. The drugs used in the treatment are prepared by a process called Potentization and the symptoms are obtained by proving on human beings[6,7].

The idea of Potentization challenges the observed dose–response relationships of modern pharmacology, according to which the effects are dependent on the active ingredient concentration in the body. Even the laws of chemistry deny the presence of original substances in higher dilutions. However, Hahnemann believed that the process resulted in the emergence of a'spirit-like' healing force from within the substance. The water memory theory which is the proposed rationale for these dilutions doesn't match with the existing laws[9].

Siliciea terra is a homeopathic drug which is a potentized form of silica. Its indication in homeopathy for boils, carbuncles, pimples, abscess is remarkable and significant and clinically observed and recorded in many homeopathic literatures[11,12,13]

1.AIM

To study the effect of Silicea Terra (12CH,30CH and 200CH potencies) in subcutaneous abscess in mice.

2. Objectives

PRIMARY OBJECTIVE

To evaluate the effect of Silicea Terra (12CH, 30CH and 200CH) in subcutaneous abscess in mice.

SECONDARY OBJECTIVE

To compare the efficacy Silicea Terra (12CH, 30CH and 200CH) with standard medicine Amoxicillin.

3. Methods

The study was divided into in-vitro and in-vivo studies.

Invitro study

As there were no prior in-vitro studies related to silicea terra and staphylococcus aureus an invitro study has been done for the same.

Procurement of chemicals and methods:

All media and chemicals such as Agar-Agar type 1, Nutrient Agar were procured from BVDUMC microbiology lab. Dispensing alcohol (ethyl alcohol 88%) was used as a Vehicle control. Amoxicillin was procured from authorised drug store.

Procurement of Microorganism:

Staphylococcus aureus procured from BVDUMC, microbiology lab **,** PUNE.

Homoeopathic Medicines:

Silicea terra 12CH,30CH, 200CH in liquid potencies were brought from approved, Standard Homeopathic Manufacturing unit

Agar Well Diffusion Method:

Agar well diffusion was used to test the antibacterial activity of homoeopathic medicines. A 24 hour old culture was swabbed onto a validated Mueller Hinton agar plate. After swabbing, the plates were incubated for 15 mins at 37^0 C. Borer was then used to make incubation wells. Each well received 40 µL of Homoeopathic Medicine Silicea in various potencies, as well as different tubes for Amoxicillin (1mg/ml) as a positive control, distilled water, and dispensing alcohol (ethanol 90%, according to HPI vol-I) as a vehicle control. The plates were then incubated at 37 ^{0}C for 24 hours. After 24 hours, the zone of inhibition was measured in centimetres. For a better result, the technique was done again for 2^{nd} time on new agar plates.

Results:

The results were positive significantly, as the in-vitro study showed *Silicea terra* has anti-bacterial efficacy against *S. aureus*. The results were as shown below in table 1

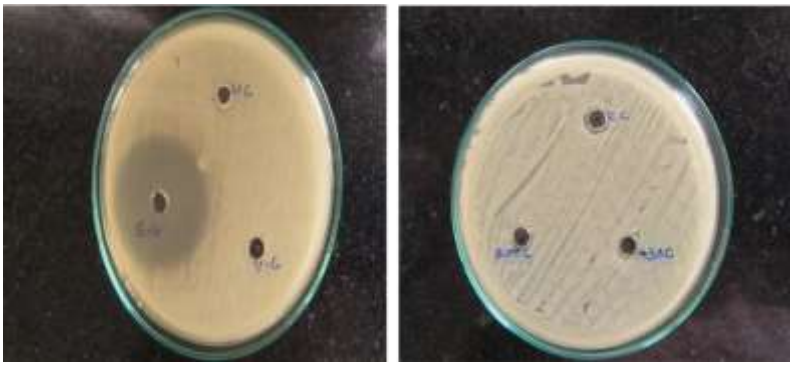


Figure 1.
Agar plate showing zone of inhibition of standard control, vehicle control, distilled water.

Figure 2. Agar plate showing zone of inhibition of Silicea terra 12CH, Silicea terra 30CH, Silicea terra 200CH.

Test drug	**Inhibition zone (Mean ±Standard Deviation) in cm**
Silicea terra 12 CH	0.8 ± 0.1
Silicea terra 30 CH	0.7 ± 0.1
Silicea terra 200 CH	0.7 ± 0.1
Amoxicillin	2.6 ± 0.1
dispensing alcohol	0 ± 0
Distilled Water	0 ± 0

Table 1 **Zone of Inhibition**

In vivo study:

Pilot study

A pilot study was carried out on 12 mice, randomly picked, of either sex before the actual experiment. This was done to assess the feasibility of inducing abscess at subcutaneous level in mice and observing the changes occurring in the tissue in terms of size over a time period of 15 days.

Preparation of inoculum and subcutaneous injection of inoculum was done according to reference of the article written by K. A. Joiner et al published in 1979 [13]. Two types of inoculums were prepared for inducing abscess in mice. The following 2 types of inoculums were made initially . The mice were handled with standard care and precautions[14,15].

S.aureus **+ Caecal content of mice:**

Mouse caecal contents were prepared with methods that insured a uniform inoculum for all animals. Caecal contents from a 1 mice was collected after sacrificing it by neck dislocation method. In a beaker 4 equal parts Peptone water was then added to the collected caecal content. The resultant slurry was filtered into a second beaker through 2 layers of surgical gauze to remove large particulate matter. The resultant mixture was subjected to autoclave at 121*c for 1 h. By the end of this procedure a net amount 3ml of autoclaved caecal content was obtained, which was then mixed with equal parts of cultured *S.aureus* inoculum .

S.aureus inoculum:

Freshly prepared Staph. aureus culture was obtained from BVDUMC microbiology lab which was then mixed with peptone water. Cultures are adjusted to 3 x 10^{8} CFU/ml. Inoculum detailed above was prepared in sterile tubes, mixed thoroughly, and 1.0 ml amounts were drawn into insulin syringes. The syringes were sealed and taken out of the anaerobic chamber so that they could be used right away to inject mice.

Trails were done with various amount of inoculum being injecting S.C into the mice to ascertain the best possible amount of inoculum to be injecting S.C for attaining a abscess of satisfactory size. The various amount of inoculum injected S.C into mice are as shown in table 3.

S.no	Quantity of inoculum	*S. Aureus* only		*S. Aureus* + caecal content of mice.	
		Male	Female	Male	Female
1.	0.25 ml	0	1	0	1
2.	0.30 ml	1	0	1	0
3.	0.35 ml	0	1	0	1
4.	0.40 ml	1	0	1	0
5.	0.40 ml	1	0	1	0
6.	0.5 ml	0	1	0	1

Table 2 **Mice group during pilot study**

All mice have developed abscess formation by day 2 after inoculation. It is also observed that the abscess formed by inoculation of S. *aureus* + caecal content had formed a larger abscess than inoculation with S. *aureus* alone, but the abscess was ruptured and drained by the end of day 2. And also, the abscess formed with *S. aureus* alone with inoculum size 0.4 ml had given satisfactory size compared to the other inoculum sizes, and abscess has not ruptured and drained till day 3. As our motto was to check the efficacy of drugs on abscess, it was required that the abscess is not drained for longer duration comparatively. So, it was hence decided after these observations that the standard inoculum for the final experiment will be with *S. aureus* alone with inoculum size 0.4 ml.

Figure 3. Abscess formed with 0.4 ml of *S. aureus only*

Figure 4. Abscess formed with 0.4ml of *S. aureus* +caecal content of mice

Main study

48 Swiss albino mice of either sex, weighing 25-30 gms (excluding pregnant and lactating mice and mice with any deformities or disabilities) were procured from Central Animal House, BVDUMC, Pune, which is registered with CPCSEA, Government of India, vide registration no.258/PO/ReBi/S/2000/CPCSEA. Each group included 8 animals in each group to avoid biological variation and to obtain data sufficient for statistical evaluation. Hence a total of 48 mice were randomly selected and allocated into 6 groups and were coded on their head, neck, back, tail, right forearm, left forearm and right hind leg, left hind leg, respectively for differentiation and identification.

Procurement of chemicals:

Standard antibiotic Amoxicillin was procured and used as standard control, Dispensing alcohol (ethyl alcohol 88%) was used as a Vehicle control, Distilled water is used as placebo control.

Procurement of Microorganism:

Freshly prepared Staphylococcus aureus procured from BVDUMC microbiology lab**.**

Procurement of animals:

48 adult Swiss albino mice weighting 25 -30 grams were procured from central animal house BVDUMC , Pune , Maharashtra, INDIA.

Homoeopathic Medicines:

Silicea terra 12CH,30CH, 200CH in liquid potencies were brought from approved, Standard Homeopathic Manufacturing unit.

Experimental procedure:

Grouping of animals

The animals were randomly grouped into a group of 8 into 6 groups. The details are as Follows.

Group 1	Distilled water
Group 2	Vehicle Control
Group 3	Positive Control
Group 4	Test Drug 1 (*Silicea terra* 12CH)
Group 5	Test Drug 2 (*Silicea terra* 30CH)
Group 6	Test Drug 3 (*Silicea terra* 200CH)

Table 3 **Animal groups**

Induction subcutaneous abscess

Recipient animals had the left flank shaved and depilated. The animals were anaesthetized by using ketamine before abscess induction, by calculating the dose of ketamine 60mg/kg . The inoculum was adjusted to 3 x 10^{8} CFU/ml. The needle was placed subcutaneously 1 cm lateral to the thoracic spine and immediately prior to the left hind extremity to inject the inoculum.

The needle was tracked anteriorly and subcutaneously for 1 cm; then the inoculum was injected. A total of 0.4 ml of *Staphylococcus aureus* inoculum was injected into each mice. All animals appeared well and fully active within 20 mins after this procedure. The mice were studied for a time period of 15 days . All mice have developed subcutaneous abscess by day 2 after inoculation.

Treatment Given:

The dosage of amoxicillin was calculated considering the mice's average weight of 30 gms. The dose for mice was extrapolated from human dose of amoxicillin[16,17].

- Positive Control – human dose of amoxicillin was converted into mice dose after considering the weight of mice as 30 gms, using the formulas and principles given in M.N Ghosh. textbook of experimental pharmacology. The final dose was obtained as 0.3 mg.
- Distilled water – plain 0.3 ml of distilled water was administered at once.
- Vehicle Control –1 ml of Placebo was mixed in 9 ml of distilled water. 0.3 ml of this solution was administered to get the required dose.
- Test Drug 1 – 1 ml of *Silicea terra* 12CH was mixed in 9 ml of distilled water. 0.3 ml of this solution was administered to get the required dose.
- Test Drug 2 –1 ml of *Silicea terra* 30CH was mixed in 9 ml of distilled water. 0.3 ml of this solution was administered to get the required dose.
- Test Drug 3 –1 ml of *Silicea terra* 200CH was mixed in 9 ml of distilled water. 0.3 ml of this solution was administered to get the required dose
- All medications were given orally with oral feeding cannula.

Group	**Test drug (Orally)**
Positive Control	0.3mg per mice for 6 days.
Distilled water	0.3 ml per mice for 6 days.
Vehicle Control	0.3 ml per mice daily for 6 days.
Test Drug 1 (*Silicea terra* 12CH)	0.3 ml per mice daily for 6 days.
Test Drug 2 (*Silicea terra 30*CH)	0.3 ml per mice daily for 6 days.
Test Drug 3 (*Silicea terra* 200CH)	0.3 ml per mice daily for 6 days.

TABLE 4 Group vice treatment dosage.

Outcome measurements

- Size of the abscess manually by measuring tape. Area was calculated by measuring the longest length and multiplying it with longest width of the abscess.

  Area = length in cm x width in cm.
- Weight was monitored on every day by using digital weighing machine..
- Progress of the abscess for time duration of 15 days.

- TLC was done on
  Day 0, before abscess is induced;
  Day 3, After bacterial inoculation, before drug administration.
  Day 15, last day i.e. end of observation.
  (Retro orbital blood was withdrawn after anaesthetizing mice, and was used to measure TLC.)

OBSERVATIONS AND RESULTS

1. Weight of the mice :

Weight of all mice in each group are daily measured and recorded. All groups of mice are given same and equal amount of feed. The weight gain pattern across the various groups of mice were similar. Day wise there is increase in the average weight of mice according to the treatment. On day 1 the average weight range between 26.5 to 27.15. As day progresses on day 15 average weight was in the range 37.25 to 37.875

2. ABSCESS FORMATION AND PROGRESSTION

- Considering day 1 as the day, on which abscess is induced subcutaneously, abscess was visibly appreciated from day 2, where there was greyish white, soft discoloration of skin externally.
- All mice have developed a similar pattern of discoloration of skin by day 2. The measurement of the external surface area of abscess was taken using a measuring tape.
- The abscess developed a size of 0.5 cm x 0.5 cm by day 2 in all the animals. The appearance of abscess on day 2, is as shown below.

Figure 6
Day – 2, (1 day after inoculation of bacteria)
Formation of abscess

2.1 EXTERNAL AREA OF ABSCESS DURING TREATMENT PERIOD.

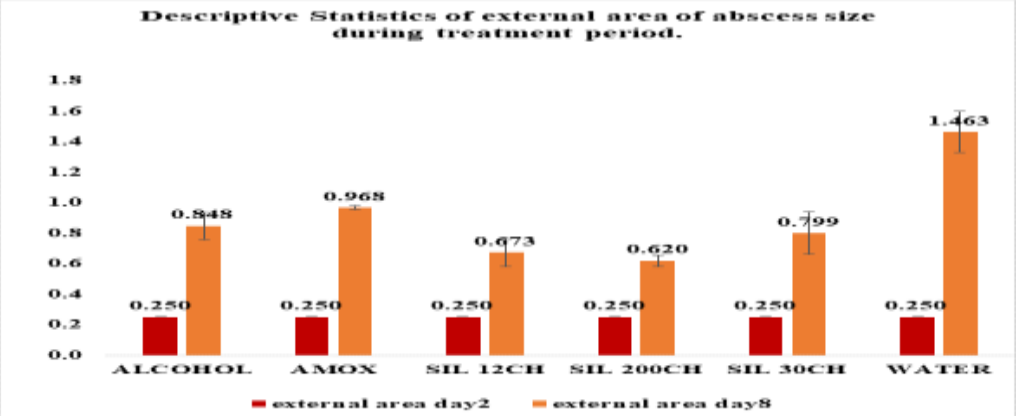
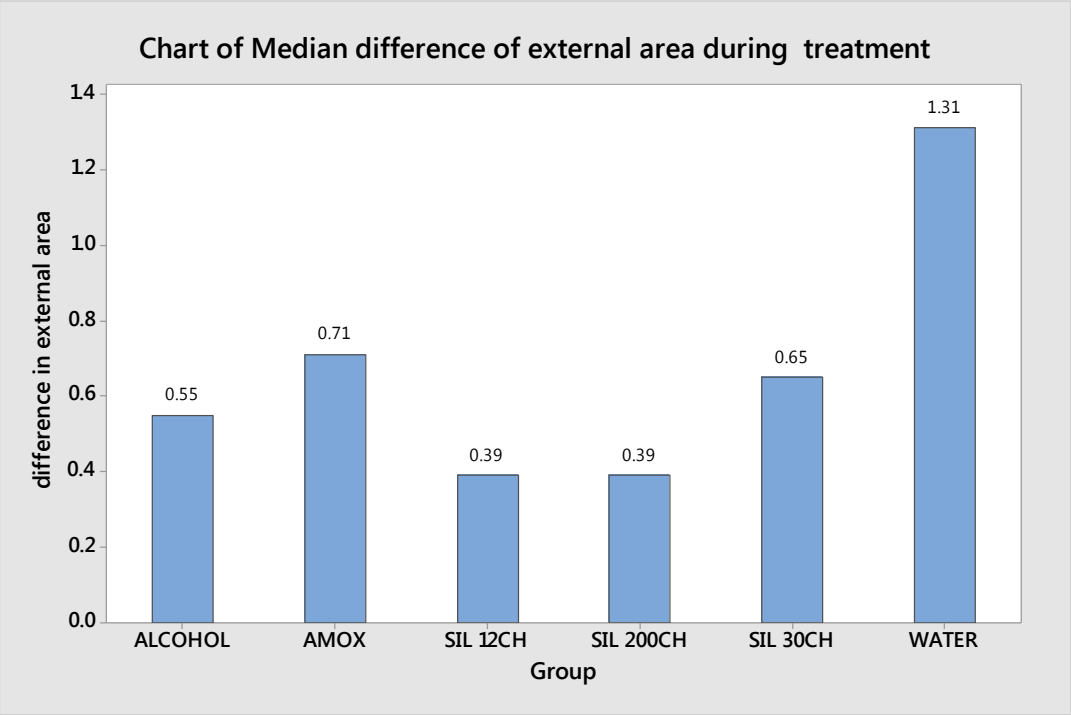


Figure 7 : Average± Sd external area of ABSCESS size in cm^2 during treatment period.

- Figure *7* show that Average ± Sd external area of Abscess size in cm^2 during treatment period (day2 to day8).
- When Amoxicillin was administered the average external area of ABSCESS size changed from 0.25±0.0 (mean ± sd) to 0.97±0.014 during treatment period.
- For *Silicea Terra 12CH* the average external area of abscess size changed from 0.25±0.0 (mean ±s d) to 0.67±0.092 during treatment period.
- For *Silicea Terra 200 CH* the average external area of abscess size changed from 0.25±0.0 (mean ± sd) to 0.62±0.037 during treatment period.
- For *Silicea terra 30 CH* average external area of abscess size changed from 0.25±0.0 (mean ±s d) to 0.80±0.140 during treatment period.
- For water average external area of abscess size changed from 0.269±0.03 (mean ± sd) to 1.463±0.135 during treatment period.
- For alcohol average external area of abscess size changed from 0.25±0.0



(mean ±s d) to 0.85±0.088 during treatment period.

Figure 8 : Median of difference in external size of abscess during treatment period.
*(Test statistic : H = 36.97 DF = 5 P value = 0.000***
*A test used: Kruskal- Wallis test, *: Significant Difference, Test Statistic-value: Test Statistic value, DF: degrees of freedom.*
*P Value <0.001, Considered to be statistically highly significant. Test Statistic Value H with 5 degrees of freedom is 36.97 with P-value 0.000** highly significant.*
Hence there is a significant difference in the treatments with respect to change in external area of abscess size during treatment period.)

- Figure 8 show the Kruskal- Wallis test result and Graph of Median values of difference in the external area of abscess size during treatment period.
- Variable under study was difference in the external area of abscess size= external area of abscess size on day 8 (end of dose)- external area of abscess size on day 2(on day after inoculation)
- When alcohol was used as a treatment the area increased by 0.55 cm^2. For water the area of abscess size increased significantly by 1.31 cm^2.
- For Amoxicillin and Silicea Terra 30 CH treatment , the area increased by 0.71 cm^2 and 0.65 cm^2 respectively.
- The increase in area was less compared that when water was applied as a treatment.
- For Silicea Terra 12CH and Silicea Terra 200 CH , the external area increased by 0.39 cm^2 during treatment period. The increase in area was significantly less compared to that ,when water was used as a treatment.

2.2 External size after treatment period (observation period)

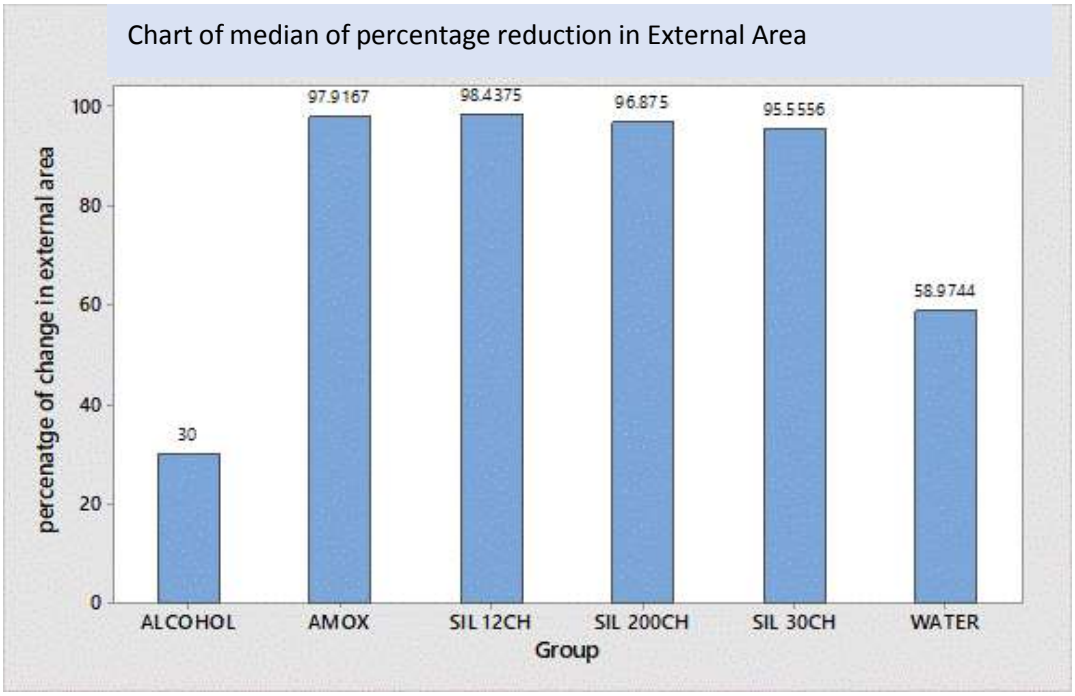


Figure 9 : **Median of Percentage change in external size of abscess after treatment period(during observation period).**

*(Test statistic : H = 38.90 DF = 5 P value = 0.000***

*A test used: Kruskal- Wallis test, *: Significant Difference, Test Statistic-value: Test Statistic value, DF: degrees of freedom.*

*P Value <0.001, Considered to be statistically highly significant. Test Statistic Value H with 5 degrees of freedom is 38.90 with P-value 0.000** highly significant*

Hence there is a significant difference in the treatments with respect to average percentage change in external area of abscess size.)

- Figure 9 show the Kruskal- Wallis test result and Graph of Median values of Percentage change in external area of abscess size.
- percimpr_extarea: Variable name for Percentage change in external area of abscess size.

- Amoxicillin shows the 97 % decrease in external area of abscess size.
- Silicea Terra 12CH shows 98% decrease in external area of abscess size.
- Silicea Terra 200 CH shows 96.8% decrease in external area of abscess size
- Whereas Silicea Terra 30 CH shows 95.5% of decrease in external area of abscess size.

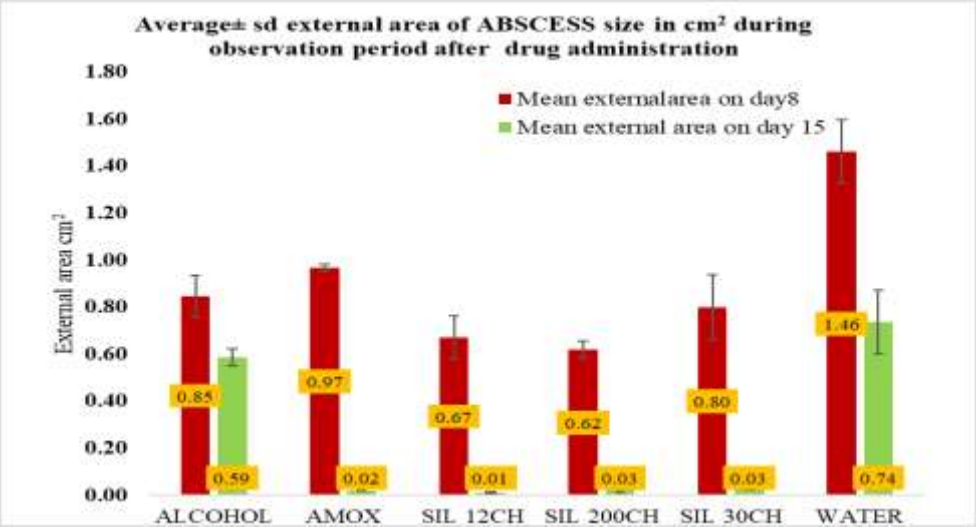


Figure 10: **Average± Sd external area of ABSCESS size in cm^2 after drug administration (during observation period).**

- Figure 10 show that Average± Sd external area of ABSCESS size in cm^2 during observation period after drug administration.
- Till day 8 treatment was given and day 8 to day 15 was observational period for treatment.
- Mean external area of abscess was observed during observation period. Before administration of drug there were 8 observations taken on external area of abscess.at the end of the experiment on day 15, four mice had SCAR MARK. They were induced with Amoxicillin, Silicea Terra 12CH, Silicea Terra 200 CH, Silicea Terra 30 CH respectively.
- When Amoxicillin was administered the average external area of ABSCESS size reduced from 0.97± 0.01 (mean±sd) to 0.02± 0.00 during observational period.
- For *Silicea Terra 12CH* the average external area of Abscess size reduced from *0.67±0.09* (mean±sd) to *0.01±0.00* during observational period.
- For *Silicea Terra 200 CH* the average external area of Abscess size reduced from 0.97± 0.01 (mean±sd) to 0.02± 0.00 during observational period.
- For *Silicea Terra* 30 CH average external area of Abscess size reduced from *0.80±0.14* (mean±sd) to *0.03±0.01* during observational period.

Figure 11

Day – 8, (1 day after treatment period)

Distilled Water (control) treatment

Figure 12

Day – 15,(end of observation).

Distilled Water (control) treatment

Figure 13

Day – 8, (1 day after treatment period)
Ethyl alcohol (vehicle control) treatment

Figure 14

Day – 15, (end of observation).

Ethyl alcohol (vehicle control) treatment

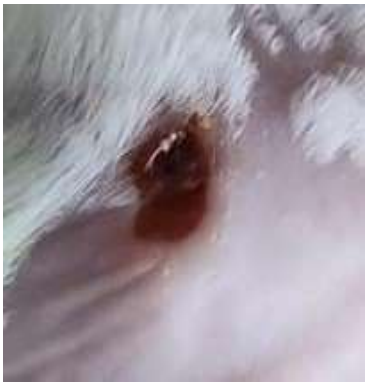


Figure 15

Day – 8, (1 day after treatment period)

***Amoxicillin* (positive control) treatment**

Figure 16

Day – 15(end of observation)

***Amoxicillin* (positive control) treatment**

Figure 17

Day – 8, (1 day after treatment period)

***(Silicea terra 12CH)* treatment**

Figure 18

Day – 15, (end of observation)

***(Silicea terra 12CH)* treatment**

Figure 19

6 Day – 8, (end of observation)

***(Silicea terra 30CH)* treatment**

Figure 20

Day – 15, (end of observation)

***(Silicea terra 30CH)* treatment**

Figure 21

Day – 8, (end of observation)

***(Silicea terra 200CH)* treatment**

Figure 22

Day – 15, (end of observation)

***(Silicea terra 200CH)* treatment**

3. TLC RESULTS :

- TLC Count At different stages are obseved. Percentage change in TLC count is measured.
- Percentage change in TLC= ((TLC on day 15- TLC on day 3) /TLC on day 3)*100
- Here Percenatge change in TLC is studied.

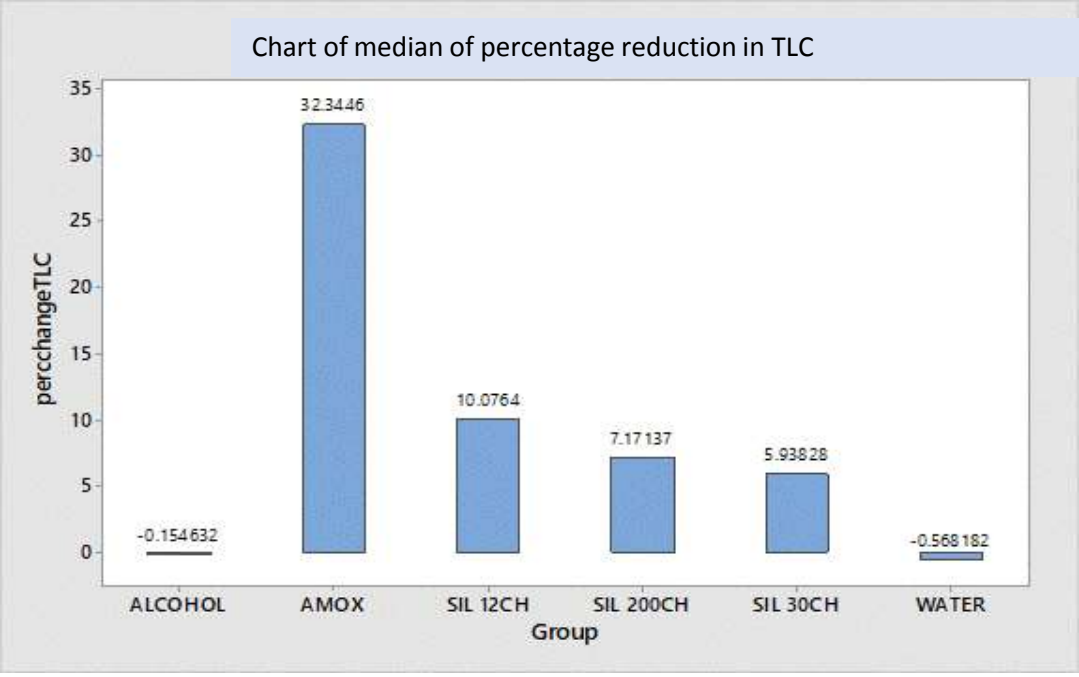


Figure 23: Median of Percentage reduction in TLC before and after drug administration

(Test statistic : H = 26.29 DF = 5 P value = 0.000**

*A test used: Kruskal- Wallis test, *: Significant Difference, Test Statistic-value: Test Statistic value, DF: degrees of freedom.*

*P Value <0.001, Considered to be statistically highly significant. Test Statistic Value H with 5 degrees of freedom is 26.29 with P-value 0.000** highly significant.*

Hence there is a significant difference in the treatments with respect to average percentage change in TLC.)

- Fig 23 show the Kruskal- Wallis test result and Graph of Median values of Percentage change in TLC.
- Percentage change in TLC: variable name of Percentage change in TLC
- Amoxicillin shows the 32% decrease in TLC. Silicea Terra 12CH shows 10% decrease in TLC. Silicea Terra 200 CH shows 7.1% decrease in TLC whereas Silicea Terra 30 CH shows 5.9% of decrease in TLC.

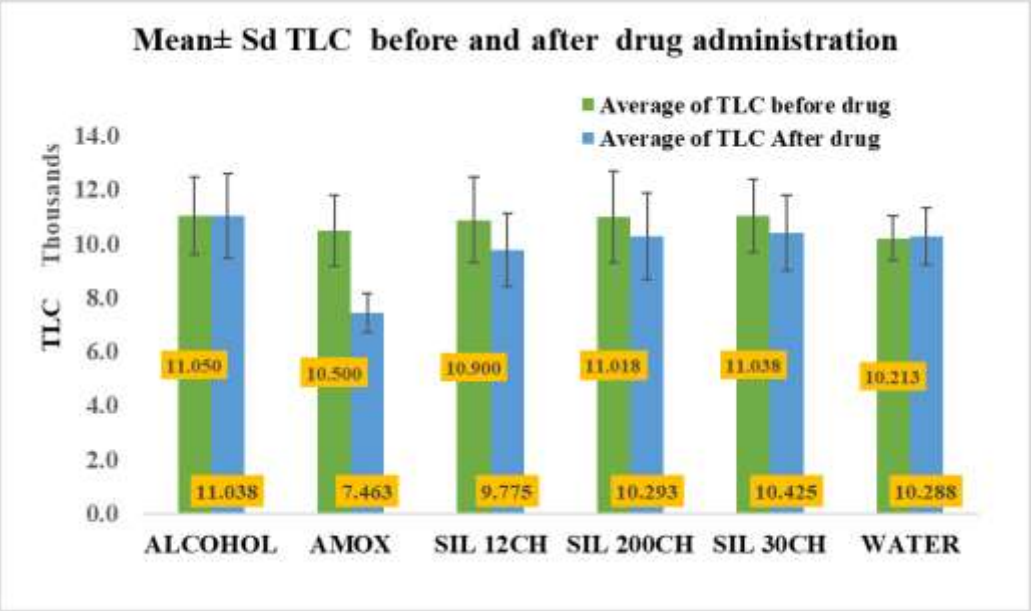


Figure 24 : figure Average TLC before and after drug administration

- Figure 24 show that Average TLC before and after drug administration according to treatment applied.
- When *Amoxicillin* is applied average TLC reduced from 10500± 1303 (mean ± sd) to 7463±723.
- For Silicea Terra 12CH the average TLC before drug administered was 10900±1569 reduced to 9775±1365.
- For Silicea Terra 200 CH the average TLC before drug administered was 11018±1680 reduced to 10293±1599.
- For Silicea Terra 30 CH the average TLC before drug administered was 11038±1352 reduced to 10425±1404.

DISCUSSION

Abscess is a common problem faced by majority of populations once in their lifetime. Staphylococcus aureus is the major causative organism for most of the abscess cases all over the world both in human beings and animal species. Treatment for abscess includes incision and drainage of abscess along with use of antibiotics which involves lot of pain and toil work both to the patient and care provider.

Homoeopathy is a science and art of cure, which is often unrecognized and neglected by the modern science due to its failure in showing evidence for its pharmacological action and materialistic presence in higher potencies. Though the end results of curing the diseases in the patients clinically is a proof for its action, modern science requires proper evidence-based research for its acceptance. *Silicea terra* is a well-known drug for its clinical use in cases of abscess. But there is no proper evidence to prove its efficacy in these cases. So, this study was taken up to show its efficacy in subcutaneous abscess in comparison to standard antibiotic amoxicillin.

The study involved both invitro and in vivo experiments to know the efficacy of silicea terra in 3 different potencies i.e. 12CH, 30CH.200CH.

In the in-vitro study, agar well diffusion method was employed to know the antibacterial activity of the drug against the most common causative organism of abscess, *Staphylococcus aureus*. The zone of inhibition was calculated in all the groups which reveled Silicea terra has an antibacterial effect against *Staphylococcus aureus.*

Similarly, the in-vivo study included subcutaneous injection of *S. aureus* inoculum in Swiss albino mice for subcutaneous abscess formation. The mice were grouped and each group were treated differently for subcutaneous abscess , which included use of *Amoxicillin* , *Silicea terra* in 3 different potencies (12CH, 30CH, 200CH) ,distilled water and ethyl alcohol (Placebo).

The mice were observed for 15 days period after which the results revealed that *silicea terra* has shown its efficacy in reducing the size of the subcutaneous abscess formation.

Additionally, it was observed that treatment groups with Silicea terra has a faster hair growth pattern compared to Amoxicillin, distilled water and ethyl alcohol groups of mice And also the active levels and energy levels are more in the test groups compared to other groups.

The study concluded by proving *Silicea terra* has a efficacy in treating the subcutaneous abscess and can employed for the same, which can be used in replacing the modern methods to incise and drain the abscess, as Homeopathic medicines are safe, inexpensive, and effective.

CONCLUSION

The study was done to know the efficacy of *Silicea terra* in subcutaneous abscess in comparison to the standard drug *Amoxicillin,* which is widely used drug in treating cases of abscess.

Our results have shown that *Silicea terra* 12CH, *Silicea terra 30CH Silicea terra 200CH* were effective in treating subcutaneous abscess.

The experiment, which involved, in-vitro, antibacterial study and in-vivo animal studies on abscess , gave a positive outcome in both the aspects .

In-vitro study done by agar well diffusion method, has shown that *Silicea terra* has an antibacterial effect against Staphylococcus aureus .

The invitro results proves that *Silicea teraa* has definitely an antibacterial effect and is not a placebo.

In-vivo study results on subcutaneous abscess in mice showed that, *Silicea terra* has a better effect in reducing the formation of abscess in terms of size.

- There was no much significant weight gain pattern in different groups of mice although there was slight difference in weight gain among *Silicea* group compared to others groups.
- The external size of the abscess was significantly reduced in all the test groups in comparison to the control groups.
- Although the difference in TLC count is better seen with *Amoxicillin* , Silicea terra has definitely shown better result in reducing the TLC count than water and ethyl alcohol.

SUMMARY

The experiment was done to know the efficacy of homoeopathic medicine *Silicea terra* in subcutaneous abscess, which is common remedy used clinically in homoeopathic practice. The results have shown that Silicea terra has a significant value in treating the subcutaneous abscess and proven that it can be a alternative for antibiotics of the modern medicine.

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