Short Communication

Action of Some Homeopathic Medicine on the Growth of Methicillin-Resistant Staphylococcus aureus (MRSA) In vitro

Tânia Aguiar Passeti*, Andrea de Andrade Ruggero, Leandro Ribeiro Bissoli, Rosimeire Navickas Constantino da Silva and Fernando Luiz Affonso Fonseca

ABC Medical School of Santo André, Rua Principe de Gales, Brazil

Abstract

Resistance to antibiotics became a major public health concern worldwide, whence new treatment are needed and homeopathy medicines used in pyogenic infection is one the options. In the present study we aimed to assess the effect of homeopathic medicines Silicea, Hepar sulfur, Belladonna and bacterial nosode on MRSA. The medicine were prepared in potencies 6 CH, 12 CH and 30 CH in sterile 30% alcohol and tested on MRSA NCTC 10442; the following parameters were assessed: in vitro bacterial growth and in vitro bacterial growth in combination with oxacillin MIC, and all the tests were compared to controls 30% alcohol. In vitro growth of MRSA exhibited statistically significant reduction in the presence of Belladonna, nosode 6 CH and 30 CH, Hepar sulfur 30 CH and Silicea 6 CH compared to 30% alcohol (p< 0.0001). The combination of Belladonna or nosode 6 CH and 30 CH and oxacillin showed a statistically significant reduction (p< 0.001). However the combination of Silicea or Hepar sulfur and oxacillin did not show statistically significant reduction. It can therefore be concluded that cultures of the MRSA treated with homeopathy respond differently to different homeopathic medicines. The results demonstrate that live cells respond in a particular way for different sorts of medicines and different potencies.

ABBREVIATIONS

NCTC: National Collection of Type Cultures; MIC: Minimum Inhibitory Concentration; Bell: Belladonna; Nos: Nosode

INTRODUCTION

Staphylococcus aureus developed resistance to methicillin. Methicillin-resistant Staphylococcus aureus (MRSA) is actually resistant to an entire class of penicillin-like antibiotics called beta-lactams [1]. Recent studies demonstrate that homeopathic treatment might improve the patients' clinical condition, reducing the need for conventional antimicrobial agents and decreasing the rate of infection relapse [2,3]. Authors suggested that homeopathic medicines might have antimicrobial effects [4,5]. Therefore, we started a research project to evaluate the in vitro effect of homeopathic drugs used in pyogenic infections [6-8]. Our study showed that Belladonna 6 CH and 30 CH and MRSA nosode 6 CH and 30 CH inhibited the in vitro growth of MRSA, while the combination of Belladonna or nosode 6 CH and 30 CH and oxacillin increased the antibiotic effect on bacterial growth [9]. In the present study we aimed to compare the effect of Belladonna, isopathic nosode on MRSA, Silicea and Hepar sulfur on bacterial growth in vitro. We measured the minimum inhibitory concentration (MIC) of oxacillin in MRSA cultures previously incubated with these homeopathic medicines. In Brazil, oxacillin is used instead of methicillin; the two drugs are similar and exhibit the same mechanism of bacterial resistance [10].

MATERIALS AND METHODS

We used MRSA NCTC (National Collection of Type Cultures) 10,442 grown in agar-blood medium and incubated at 37°C for 24 h. Then a bacterial suspension in sterile saline solution measuring 0.5 on the McFarland scale was prepared. The suspension was also diluted in Mueller Hinton (MH) broth (Difco, USA) 1:10 before use. The homeopathic medicines were prepared according to the 3rd edition of the Brazilian Homeopathic Pharmacopoeia [11].The medicine were diluted and dynamized in 30% alcohol to potencies 6 CH, 12 CH and 30 CH (HN-Cristiano, Brazil). A 250 µL volume of each tested homeopathic medicine was added to tubes containing 3 mL of MH broth. Then 10 µL of bacterial diluted 1:10 was added to each tube. The tubes were homogenized and incubated at 37°C for 24 h. After that, bacterial growth was evaluated with spectrophotometer (Gehaka UV-330G, Brazil) at 600 nm [12]. MIC of oxacillin in the presence of homeopathic medicines was determined according to CLSI (Clinical and Laboratory Standards Institute) 2014 standards [13]. A volume

of 420 µL of Belladonna or MRSA nosode 6 CH and 30 CH or Silicea 6 CH or Hepar sulfur 30 CH, was added to 5 mL of cation-adjusted MH broth (MH II). A volume of 20 µL of MRSA in the same diluted. The tubes were incubated at 37°C for 3 h. A 50 µL volume of the bacterial suspensions was added to 96-multwell plates, previously prepared with 50 µL of serial dilutions of oxacillin in MH II broth in concentrations ranging from 16 to 0.5 mg/mL. The plates were incubated at 37°C for 24 h, and bacterial growth was measured with spectrophotometer at 600 nm[12]. According to CLSI 2014 criteria the MIC of oxacillin for MRSA is 4 mg/mL [13]. The experimental data were evaluated by analysis of variance (ANOVA) and Tukey’s test with significance level of p < 0.05 (Graphpad software Prism version 5).

RESULTS AND DISCUSSION

Passeti 2016, evidenced the in vitro growth of MRSA exhibited statistically significant reduction in the presence of Bell and nosode 6 CH and 30 CH. Treatment of MRSA with combination of Bell 6 CH and 30 CH or nosode 30CH and 16, 8, 4 and 2 mg/mL of oxacillin induced significant decrease of bacterial growth. The results showed that combination Bell or nosode with antibiotic induced increased inhibition of the bacterial growth than homeopathic medicine alone [9]. In this study we compared the effect of Silicea and Hepar sulfur medicines on the in vitro growth of MRSA bacterial, knowing that these medicines are also used for pyogenic bacterial infections.

The results demonstrate that Silicea 6 CH (p<0.001) and

![Figure 1](image1.png)

Figure 1 Effect of homeopathic medicines on MRSA in vitro growth. Bacteria were cultured with (MH medium and 30% alcohol) or with Bell, Nos, Silicea and Hepar sulfur 6CH, 12CH and 30CH prepared with 30% alcohol. Statistically significant differences were investigated among 30% alcohol and medicines treated bacteria (*p < 0.001 ANOVA and Tukey).

![Figure 2](image2.png)

Figure 2 Effect of homeopathic medicines combined with oxacillin on MRSA in vitro growth bacteria were cultured (control with 30% alcohol) or with Bell or Nos 6CH and 30CH, Hepar sulfur 30CH or Silicea 6CH diluted in 30% alcohol and combined with oxacillin 16, 8, 2,1 and 0.5 mg/mL. Statistically significant differences were investigated among control or medicine treated MRSA alone or in combination with oxacillin at 4 mg/mL (MIC) (*p < 0.0001 ANOVA and Tukey).

**Abbreviations:** Bell: Belladonna; Nos: MRSA nosode; Hepar: Hepar sulfur
Hepar sulfur 30 CH (p<0.001) can inhibit the in vitro MRSA growth (Figure 1). The combination of these medicines with oxacillin antibiotic did not show influence on the in vitro bacterial growth (Figure 2). We suggest that only Belladonna and the MRSA nosode have the ability to make the bacterial more susceptible to the antibiotic action.

Assessing the activity of the different potencies on in vitro bacterial growth, we observed that 12 CH potency did not show action on the cultures. This demonstrates that living cells respond differently to different homeopathic potencies, than suggesting that a further kinetic study may be appropriate.

CONCLUSION

Belladonna or nosode interfere in the metabolism of the MRSA and alter it to become more susceptible to the oxacillin antibiotic action in bacterial culture. The MRSA treated with Silicea and Hepar sulfur reduced in vitro growth, but didn’t interfere on oxacillin antibiotic action. Different potencies of the same medicine produce different responses on the microorganism growth, suggesting that a further kinetic study may be appropriate.

ACKNOWLEDGEMENTS

Funding Sources: ABC Medical School of Santo André Fundation

REFERENCES


