

ORIGINAL PAPER

Action of antibiotic oxacillin on *in vitro* growth of methicillin-resistant *Staphylococcus aureus* (MRSA) previously treated with homeopathic medicines

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Background: Resistance to antibiotics is a major public health concern worldwide. New treatment options are needed and homeopathy is one such option. We sought to assess the effect of the homeopathic medicine *Belladonna* (Bell) and a nosode (biotherapy) prepared from a multi-drug resistant bacterial species, methicillin-resistant *Staphylococcus aureus* (MRSA), on the same bacterium.

Methods: Bell and MRSA nosode were prepared in 6cH and 30cH potencies in 30% alcohol and sterile water, according to the Brazilian Homeopathic Pharmacopeia and tested on MRSA National Collection of Type Cultures (NCTC) 10442. We assessed *in vitro* bacterial growth, deoxyribonuclease (DNAase) and hemolysin activity, and *in vitro* bacterial growth in combination with oxacillin (minimum inhibitory concentration – MIC). All values were compared to control: 30% alcohol and water.

Results: *In vitro* growth of MRSA was statistically significantly inhibited in the presence of Bell and nosode 6cH and 30cH compared to controls ($p < 0.0001$); and with combination of Bell or nosode 6cH and 30cH and oxacillin ($p < 0.001$). Bell 30cH and nosode 6cH and 30cH significantly decreased bacterial DNAase production ($p < 0.001$) and reduced red blood cell lysis.

Conclusions: Cultures of MRSA treated with *Belladonna* or MRSA nosode exhibited reduced growth *in vitro*, reduced enzymatic activity and became more vulnerable to the action of the antibiotic oxacillin. Further studies are needed on the biomolecular basis of these effects. *Homeopathy* (2016) ■, 1–5.

Keywords: MRSA; *Belladonna*; Nosode; Oxacillin; *In vitro* growth; DNase; Hemolysin

Introduction

Resistance to antibiotics is a major public health concern worldwide; growing resistance to multiple drugs is attributed to excessive use of antimicrobials.¹ According to the World Health Organization, infectious diseases are the third commonest cause of death around the world, in spite of antibiotic therapy.² This situation is exacerbated by the increased incidence of infections with multidrug-resistant

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Received 2 November 2015; revised 30 August 2016; accepted 26 October 2016