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AN INVITRO STUDY TO COMPARE THE ANTIBACTERIAL ACTIVITY OF LOWER DILUTIONS OF BAPTISIA TINCTORA AND MURIATIC ACID AGAINST SALMONELLATYPHIMURIUM

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ABSTRACT
Typhoid fever is brought on by ingesting food or water contaminated by habitual carriers of Salmonella typhi. The bacteria are rod-shaped Bacillus, which measure between 1 and 3.5 microns in size. They are members of the Enterobacteriaceae family, motile with peritrichous flagella, and facultatively anaerobic. The preventive efficacy of Baptisia tinctoria in lesser dilutions is acknowledged by William Boericke in his "Pocket Manual of Homoeopathic Materia Medica and Repertory". Production of antibodies against Bacillus typhosus, raises the natural body resistance towards the attack of typhoid condition. This study is aimed to evaluate the antibacterial activities of lower dilutions of homoeopathic medicines Baptisia and Muriatic acid against Salmonella typhi. Thus, it is used in 30C&200C potencies to screen the bacteria by Agar Well-Diffusion assay. Baptisia 30C & 200C,Muriatic acid 30C &200C doesn't showed any inhibitory activity against Salmonella typhi by Agar well-diffusion assay. This experiment clearly showed that the lower dilutions of both the Homoeopathic medicines Baptisia and Muriatic acid has no antibacterial property against Salmonella typhi.

KEYWORDS: Baptisia,,Muriatic acid , Salmonella typhi, Zone of inhibition
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INTRODUCTION
Salmonella are small, Gram-negative rods with dimensions of 1-3 x 0.5 micrometers. They have peritrichous flagella and are mobile. Salmonella, which causes typhoid fever, is facultatively anaerobic and aerobic. The enteric group and the food poisoning group are just two of the approximately 2000 serotypes or species that they currently consist of. On simple media with a pH range of 6 to 8, and a temperature range of 15 to 41C, these bacteria thrive easily. Salmonella has antigens like the surface antigen Vi, the somatic antigen O, and the flagellar antigen H. Following infection or vaccination, the H antigen is highly immunogenic and generates high titers of antibodies quickly[1]
Salmonella are strictly animal or human parasites. Enteric fever, gastroenteritis or food poisoning, and septicemia with or without local suppurative lesions are the clinical symptoms caused by salmonella. In the Indian subcontinent, typhoid and paratyphoid fevers, which are transmitted via the fecal oral route through contaminated food and water, are major causes of fever. Typhoid fever is brought on by Salmonella typhi. The bacilli localize mostly in the lymphoid tissue of the small intestine after a few days of bacteremia, causing the characteristic lesions in the Peyer's patches and follicles. They initially swell, then ulcerate and heel.[2]
Patient will experience fever, headache, myalgia, relative bradycardia, constipation, diarrhea, and vomiting throughout the first week of the illness. Because the first week's symptoms resemble those of a generalized infection, diagnosis may be challenging. At the conclusion of the first week, we might see rosy spots on the trunk, splenomegaly, a cough, or diarrhoea. Delirium, coma, and death follow at

the end of second week, if untreated. There is typically leucopenia. Multiple cultures boost the yield and help to establish the diagnosis. In the second and third weeks, positive stool cultures are frequently found. The Widal test is non-specific, but it can identify antibodies to the O and H antigens. Bowel perforation and hemorrhage, bone and joint infection, cholecystitis, meningitis, myocarditis, nephritis, and prolonged gallbladder carriage are all typhoid fever complications.

MATERIALS AND METHODS

Bacterial strain:

Standard strains of Salmonella typhi were used for this study. The culture was grown in Nutrient agar media.

Type of Study:

Experimental in vitro study carried out on Salmonella typhi

Homoeopathic medicine:

Drug for the study will be procured from Homoeopathic pharmaceuticals. In this study, Homoeopathic medicine Baptisia and Muriatic acid 30C and 200C was purchased from Willmar Schwabe which is an approved and standard homoeopathic medicine manufacturing unit.

Study setting:

Microbiology lab, Research Facilitation Centre, Sarada Krishna Homoeopathic Medical College Research Lab,Kulasekharam

Selection of sample:

In this study, Muller Hinton agar plates was used for antibacterial screening and plain Whatman Filter Paper disc of 6mm diameter.

Method of collection of Data:

Disc diffusion method was used for conducting the study or obtaining data.

Methodology:

Preparation of disc

Plain sterile disc was purchased from Hi media and soaked with each concentration of extracts and placed at room temperature to get air dry for 6 (six) hrs. Then, the disc paper was labelled and used for antibacterial study.

Preparation of medium

Muller Hinton Agar (MHA) is more commonly used for the routine susceptibility testing of non-fastidious microorganism by the Kirby-Bauer disk diffusion technique. The agar was prepared by suspending 38gm of the medium in one litre of distilled water. It was then heated with frequent agitation and boiled for one minute to completely dissolve the medium. Followed by Autoclaving at 121°C for 15 minutes and Cooled in room temperature. The cooled solution was then poured into sterile petri dishes on a level,horizontal surface to give uniform depth. And the final pH was then checked. The plates were stored at 2-8 degree Celsius. At the end of incubation, inhibition zones were examined around the disc.The size of the zone of inhibition (including disc) was measured in millimeter (mm). The absence of zone inhibition was interpreted as absence of activity. The activities were expressed as resistant, if the zone of inhibition was less than 7 mm, intermediate (8-10 mm) and sensitive if more than 11 mm.

Determination of Antibacterial activity(kirby-bauer method)

The study was done in vitro antibacterial study against salmonella typhi with baptisia and muriatic acid 30 and 200 potency. Ethanol was used as negative control and ciprofloxacin 500 mg used as positive control. The Antibacterial Activity Was Performed following Kirby-Bauer method. The Muller Hinton agar plate was prepared and solidified. After solidification of the plates the salmonalla typhi inoculum was uniformly swabbed over the molted solidified Muller Hinton plate. The plate were undisturbed for 5 minutes, after 5 minutes the plates were taken and the sterile disc 6mm were placed on the appropriate position using sterile forceps. Intervention and controls are loaded over the disc denoted as BP (Baptisia tinctoria),MA (Muriatic acid),NC (negative control, ethanol) PC (positive

control, Ciprofloxacin 500 mg).The plates were incubated 37˚c for 24 hours. After 24hrs the result will observed by measuring the zone of incubation in millimeters and recorded.

RESULTS

Fig 1: Zone of inhibition after 24 hrs of medicinal suspension

Table 1. Zone of inhibition of Baptisia tinctora 30C and 200C against salmonella typhi

Code no	Potency	Zone of inhibition
PC	Control	15 mm
NC	90% alcohol	0 mm
BP 30	30 C	0 mm
BP 200	200 C	0 mm

Table 2. Zone of inhibition of Muriatic acid 30C and 200C against salmonella typhi

Code no	Potency	Zone of inhibition
PC	Control	19 mm
NC	90% alcohol	0 mm
MA 30	30 C	0 mm
MA 200	200 C	0 mm

DISCUSSION

In a study conducted ten prepared mother tinctures were tested against five clinically important human pathogenic bacteria. In this all-mother tinctures showed more or less antibacterial activity. Cinchona officinalis had maximum activity (89% inhibition) against salmonella than all the tested mother tinctures[3] Another study was to find out the effectiveness of the homoeopathic medicines which are prescribed with the help of Murphy's Repertory so as to reduce the intensity of the symptoms in the management of cases of typhoid fever, with patient oriented individualization study. All the symptoms related to typhoid fever have been mentioned. For example abdominal symptoms, symptoms related to delirium, hemorrhage, brain, symptoms in children etc. Homoeopathic medicines were used; Lachesis being the most common. Others being Arsenic Album, Bryonia, Baptisia, Hyoscyamus, Mercurius, Muriatic Acid, Phosphorus, Rhus tox, Stramonium, Natrum Mur, Sulphur, Croton Tig and Homoeopathic medicines were used [4]Due to the antigenic varieties of Salmonella, a homoeopathic

remedy will allow the vital force immediately to deal with any exposure agent. It appears to actuate resistant framework by initiating both T and B cells by the arrangement of antibodies. Further expansion of experimental studies needs to identify the exact appliance of homoeopathic medicines against Salmonella typhi[5].Homoeopathy is both preventative and restorative in epidemic conditions by administering genus epidemics. William Boericke in his "Pocket Manual of Homoeopathic Medical Specialty" recognizes the precautionary power of Baptisia tinctoria in lower dilutions. Production of antibodies against Bacillus typhosus, raises the natural body resistance towards the attack of typhoid condition[5],[6]

CONCLUSION

From this study it is evident that both baptisia tinctoria and muriatic acid 30 and 200 potency shows Zero mm as zone of incubation .This study conclusively shows that the homoeopathic medicine Baptisi tinctora 30 and200, and Muriatic acid 30 and 200 cannot inhibit the growth of Salmonella typhimuriaticum. Further research on this topic with tinctures and lower potencies should be done to prevent the growth of S.typi for the benefit of humanity as S.typhi is the causative factor for the common fever Typhoid.

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