HYPOTENSIVE EFFECT OF FREEZE-DRIED GARLIC (ALLIUM SATIVUM) SAP IN DOG

Pages with reference to book, From 12 To 13

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Abstract

Watary extract of ALLIUM SATIVUM when administered Intravenously (I.V.) to NORMOTENSIVE dogs, produced a significant fall in their mean blood pressure. This effect was not antagonized by atropine or antihistamines. The extract increased the activity of Isolated Guinea Pig Ileum preparation. This effect of A Sativum was blocked by Diamentane (JPMA 31:12, 1981).

Introduction

Indigenous herbs and plants need thorough investigation for isolation of pharmacologically active constituents. Those plants which have formed a part of daily diet offer a special advantage. These have been consumed for so long a time that, their toxic effects are unlikely. One such vegetation is the garlic. People have been using juice crushed out of garlic bulb and flashy leaves for various ailments such as indigestion and hypertension. Previous workers have studied the effects of juice and essential oil of Allium Sativum on animals (Dewar and Oliver, 1971; Bordia and Bansal, 1973). Recently its sap has been extracted by a process of dialysis through the cell walls of the garlic tissue. This method preserves those ingredients, which were presumably not extracted by other methods. A specimen of this sap was subject to a preliminary study of its hypotensive properties. It was freeze-dried to save its labile components.

Material and Methods

Freeze-dried garlic sap was kept in a desi-cator over calcium chloride to bring it to the room temperature and was then dissolved in distilled water to get a 10% w/v solution, which appeared to be colloidal. It was stored in a refrigerator and was given intraperitonealy (after bringing it to room temperature) to mice to determine acute toxicity. One gram of dried sap is equivalent to 10 grams of garlic flesh. For its effect on blood pressure and respiration it was given intravenously in graded doses to dogs anesthetized with 35mm/kgB.W. of pentoberbit-one sodium. Blood pressure, respiratory movements and intraluminal pressure of jejunum were recorded on a kymograph. In four experiments, effect after intravenous atropine 12 mg/kg B.W. was also noted. An experiment to find its action on the isolated guinea pig ileum before and after dimentane, was also performed.

Observation and Results

Garlic sap is not completely soluble in water and forms a colloidal solution, which was brown in colour; a part settled down as amorphous sediment on keeping for some time. It was non-toxic to mice at 1-2 G/kg body weight in 24 hours.

Effect on Blood Pressure :

In the dog, garlic sap produced a fall in blood pressure lasting 1-5 minutes. Doses producing 25 percent fall in mean blood pressure have been graphically determined and are shown in the table.

Experiment No.	*Dose producing 25% fall in mean blood pressure*
1.	31 mg/kg B.W.
2.	42 mg/kg B.W.
3.	47 mg/kg B.W.
4.	63 mg/kg B.W.
5.	47 mg/kg B.W.
6.	56 mg/kg B.W.
Average dose	48.5 mg±4.3/Kg B.W. (Mean±S.E.)/kg. B.W.

The average dose producing 25 percent fall in the mean blood pressure was calculated as 48.5±4.3 (S.E.) mg/kg body weight. In one experiment 120 mg/kg body weight of garlic sap was required, 37 minutes after administration of 12 mg/kg body weight of atropine (intravenously) to produce 25 percent fall in mean blood pressure. In the other experiments no significant change in dose was noted.

Effect on Respiration :

Increase in respiratory rate and depth accompanied all doses of the garlic sap even though they were insufficient to produce a significant fall in blood pressure. It also increased intestinal movements.

Table: Showing Fall in Mean Blood Pressure of Anaesthetized NORMQTENSIVE Dogs after Administration of INTRAVENOUS Doses of Allium Sativum Sap.

Effect on Intestinal Movement :

A graded dose-response tracing on isolated guinea pig ileum was obtained. Curve has been plotted and the dose which produced 50 percent of the maximum response turned out to be 29 mg/5 ml. Effect on intestinal movements lasted for a long time. This response was abolished by dimetane.

Discussion

The effect of garlic sap on the blood pressure indicates that one of its chemical constituents produces hypotension either directly or indirectly. The concentration of this compound (active principal) in the garlic sap is however low. The substance appears to have a low potency as compared to acetylcholine or histamine.

Atropine slightly blocks its action showing thereby, that its effect is not mediated through the parasympathetic nervous system. Had it been so it would have increased the blood pressure when given after atropine.

A 25 percent fall in mean blood pressure was selected because this degree of response was on the linear part of the curves and permitted a comparison with acetylcholine and histamine.

The contraction of isolated guinea pig ileum with garlic sap was proportional to the dose and it was completely blocked by dimetane (an antihistaminic drug). This observation points to the possibility that this action of garlic sap maybe mediated through histamine or some other mechanism. Dewar et al (1971), Bordia et al (1975) and Bordia et al (1975) have found to have significant protective action against fat induced increase in serum cholesterol and plasma fibrinogen and decrease in fibrinolytic activity as well as coagulation time.

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