

## ADVERSE REACTIONS ASSOCIATED WITH AMINOPENICILLINS IN INDIAN POPULATION

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**Abstract:** The overall incidence of adverse drug reactions following ampicillin and amoxicillin administration to 439 and 169 indoor patients of All India Institute of Medical Sciences, New Delhi were 19.13% and 15.5% respectively. Ampicillin produced diarrhoea (7.74%), nausea and vomiting (7.74%) anorexia (5.46%) headache (4.10%) and allergic reactions (2.9%). With amoxicillin, anorexia was observed in 4.79%, epigastric distress in 5.9% headache in 6.58%, coating of tongue in 8.98% and dizziness in 1.79% of patients. Intramuscular route of administration of ampicillin produced least ADRs. Females were more susceptible to adverse reactions of ampicillin and males to amoxicillin. Incidence of ADRs by these two aminopenicillins is less than that reported from abroad.

**Key words:** ampicillin                      amoxicillin                      ADRs                      aminopenicillins

### INTRODUCTION

Ampicillin and amoxicillin are the two commonly used aminopenicillins in our country. Ampicillin is used parenterally as well as orally. This study was undertaken to monitor and compare ADRs of ampicillin and amoxicillin in indoor patients of a teaching hospitals.

### METHODS

Four hundred and thirtynine and 167 adult patients ranging between 20-65 years receiving ampicillin and amoxicillin respectively in different wards of All India Institute of Medical Sciences were monitored for adverse drug reactions during their stay in the hospital. Patients who received drug for atleast five days were included in this study. Dose of ampicillin and amoxicillin ranged between 1.5 to 2.0 gm and 0.75 g per day respectively. Severity of disease determined the route of administration of ampicillin. Patients with positive intradermal sensitivity test, which was done in patients advised to receive ampicillin parenterally, were excluded from this study. Patients were observed daily, ADR's were recorded on a standard proforma. Dechallenge was attempted wherever possible to establish cause effect relationship.

### RESULTS

Adverse reactions to ampicillin were observed in 19.13% patients. Route of administration influenced the outcome of ADRs the incidence being highest following oral (20.62%) and least with intramuscular administration 8(14.74%). ADRs related to GIT were not influenced by the duration of therapy. Non itching rubella type skin rash appeared in six patients, two of them developed rashes after 6 days and rest on 15th day. One patient with negative skin test reaction had skin rash following IV ampicillin. Drug induced fever was noticed in 7 patients. The fever subsided following dechallenge.

Twentysix patients developed diarrhoea on first or second day of administrations while 9 had it in the second week. Diarrhoea was self limiting in 21 while 8 required antidiarrhoeal. Time of meals failed to influence the incidence of diarrhoea. Anorexia was reported after 5-6 doses of drug had been administered while-nausea and vomiting were noticed between 3rd to 6th day. With IV administration not only the incidence of nausea and vomiting was higher but it also appeared within hours of ampicillin administration. The incidence of GIT symptoms was higher in females

than males ( $P < 0.001$  Table I). All adverse reactions responded to dechallenge.

uncontrolled infection and superinfection was ruled out. Incidence of diarrhoea in patients who received

TABLE I : Incidence of ADRs of ampicillin and amoxicillin according to sex of the patients.

ADR:	Ampicillin			Amoxicillin		
	Male	Female	Total	Male	Female	Total
No. of patients	241	198	439	95	72	167
Patient with ADRs	35(14.5%)	49(24.74%)	84(19.13%)	12(12.63)	14(19.44)	26(15.56)
Type 'A'						
Nausea and vomiting	17(7.0%)	17(8.5%)	34(7.74%)	5(5.26%)	5(6.96%)	10(5.98%)
Diarrhoea	17(7.0%)	17(8.58%)	34(7.74%)	5(5.26%)	3(4.16%)	8(4.79%)
Anorexia	9(3.7%)	**15(7.57%)	24(5.46%)	11(11.57%)	9(12.5%)	20(11.79%)
Headache	7(2.9%)	11(2.9%)	18(4.1%)	7(6.65%)	4(5.55%)	11(6.58%)
Abdominal pain	-	-	-	5(5.26%)	2(2.7%)	7(4.19%)
Type 'B' reactions						
Skin rash	-	6(1.0%)	6(1.3%)	-	-	-
Fever	4(1.65%)	3(1.5%)	7(1.59%)	2(2.10%)	1(1.38%)	3(1.79%)

\*\* $P < 0.01$

Table I gives incidence of adverse reactions of amoxicillin according to sex of the patients. Both the sexes were equally susceptible to all adverse reactions except that incidence of abdominal pain round umbilicus was higher in males ( $P < 0.05$ ).

Hypersensitivity reactions to ampicillin are reported to be 5.20% (1). In present study the incidence was found to be 2.9% a figure closer to that reported (3.1%) by Verma et al (2). One patient developed skin rash even after exhibiting negative hypersensitivity in the initial skin testing. Ampicillin is known to produce delayed hypersensitivity reactions and can not be ruled out by skin test (3). Fever is a common manifestation of drug allergy and although usually associated with presence of other signs and symptoms of allergy may be the only clinical manifestation in some patients (4). Fever occurred in 7 patients and was a manifestation of drug reaction, as possibility of

ampicillin intravenously or orally was similar. However the incidence is lower in this study as compared to earlier reports (2,5,6). Irritation of gut is unlikely to be the cause as I/V ampicillin also produced diarrhoea to the same extent. Higher incidence of nausea and vomiting following I/V ampicillin suggests another mechanism contributing to gastric irritation in causing these reactions. The present investigation can not explain the higher incidence of ADRs in females. Headache was the only CNS manifestation in this study and it was seen in patients who received ampicillin parenterally, as well as orally.

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