

## **An expressive study of Mushroom poisoning cases in Lakhimpur district of Assam**

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### **Abstract:**

Now a day Mushroom poisoning have become a most important problem in diverseregion of India with a greater extent in different location of Assam. A descriptive study of mushroom poisoning cases was conducted in different location of Lakhimpur district of Assam from 2011 onwards. Stool samples were collected in a carry blair media from those patients suspected to be afflicted with the complain of fever, headache, stomach pain or loose watery stool after taking mushroom were enrolled in the study. Mixed growth of E. Coli & Staphylococcus aureus was found in two nos of them out of total Sixty eight patients and rest showed normal growth of E coli. All patients developed above symptoms after taking 2-3 hour of taking wild mushroom so it was confirmed as the source of infection. 74% of the affected patients showed abnormal liver function test (LFT) and kidney function test. All the age group and both the sexes were affected. Case fatality rate was higher in Bihpuria block. Most nos of mushroom poisoning cases were reported from Bihpuria and Dhalpur BPHC.

Key word: E coli, KFT, LFT, Mushroom poisoning etc

## **Introduction:**

A mushroom is the reproductive structure produced by some fungi. These are somewhat like the fruit of a plant. They belong in a kingdom of fungi which is distinct from plants and animals. Generally, Fungi make their food using their mycelium grows into or around the food source, secretes enzymes that digest the food externally, and the mycelium then absorbs the digested nutrients. There are so many different types of mushrooms. The various kinds of mushrooms all have different flavors, shapes and textures. Although the nutrient profile varies from type to type, most mushrooms are good source of B vitamin, selenium, iron and other minerals. Out of many kinds of wild mushrooms some are poisonous and some are edible and delicious when properly prepared. The edibility of the majority is either not known or they are not considered for food because of their small size or poor flavor or texture.

There are 14 distinctive types of mushroom poisoning found worldwide so far. The most frequent form of mushroom poisoning is caused by a wide variety of gastrointestinal irritants after taking wild poisonous mushroom. The symptoms usually appear within 20 minutes to 4 hours of ingesting the mushrooms, and include nausea, vomiting, cramps, and diarrhea, which normally pass after the irritant had been expelled.

Now a day Mushroom poisoning become a large problem in different parts of India. More than 2000 species of mushrooms are known of which about 300 have been reported from India<sup>[3]</sup>. At present there are about 24 genera split up into 150 species of edible mushrooms of which cultivation of some has already expected a commercial scale while others have been exploited for increasing cultivation in near future<sup>[4]</sup>. In Assam a large number of people died every year due to mushroom poisoning. Causes of mushroom poisoning are substances produced by and contained in the fruit body. These substances may act immediately at the gastrointestinal level, causing stomach distressed by a complete absorption of the poison. They may enter the blood stream as toxins and affect various organs, in some cases fatally damage the vital organs (liver and kidney) leading to death. There are a very few studies conducted in Assam regarding the ethno-botanical aspect of traditional medicinal plants along with native mushroom flora<sup>[1, 2]</sup>. As now a day cases of mushroom poisoning occurs frequently in some parts of Assam but till now there are no descriptive study could be undertaken regarding the epidemiological aspects of Mushroom poisoning cases in Assam. From last couple of years it was observed that in every year there are at least three or more outbreak of mushroom poisoning cases were came into

noticed from Lakhimpur district of Assam which becomes a great concern so as to keep importance of the study to focused among general people as well as researchers.

### **Materials and Methods:**

Those patients suspected to be afflicted with the complain of fever, headache, stomach pain or loose watery stool after taking mushroom were enrolled in the study. Patients of all the age group and both the sexes were included in the study. Patients consent was taken before collecting the stool sample. Institutional Ethical committee was informed about the study and permission was obtained. Stool samples were collected from the patients prior to taking antibiotics. Stool samples were collected in a Carry Blair media and sent to different apex laboratories (GMCH/AMCH/RMRC) for culture and sensitivity test. We collected blood samples from 50% of the affected patients for liver function test (LFT) and kidney function test (KFT) and examined at pathology laboratory, North Lakhimpur Civil Hospital.

### **Epidemiological investigation and Result:**

During the Month of April-June, the rain fall started in this whole areas due to which wildmushroom grew up and the people take it sometimes as a food. During the year 2011, mushroom poisoning cases were reported four times from different location in Lakhimpur district of Assam

1. In 2011, during the month of April, a total of thirteen patients developed fever, vomiting and stomach pain after taking wild mushroom in Bahgora Deuri gaon under Bihpuria Block. The outbreak continued for 2 days started on 1<sup>st</sup> April, 2011 and ended on 2<sup>nd</sup> April. Out of thirteen patients, seven of them were expired. One patient developed post hepatic symptoms one month after the outbreak. Stool sample was collected from all the patients. Mixed growth of E. Coli & Staphylococcus aureus was found in stool specimen of two nos of patients and other showed growth of E coli. Adult males are more affected.
2. As on dated 2<sup>nd</sup> April, two nos of adult female from Kathojan Deurigaon under Dhalpur block developed stomach pain and dizziness after taking wild mushroom. Stool sample collected. Result showed normal growth of E coli
3. On 7<sup>th</sup> June, four parson from 2 no Rampur under Nowboicha block and on the next day six person from Seajuli under Boginodi block developed symptoms like vomiting and

stomach pain due to same cause. Stool sample collected. Result showed normal growth of E coli. All age group and both the sexes were affected.

In 2012 there are five outbreak of mushroom poisoning cases were investigated

1. On 20<sup>th</sup> April 2012, fourteen person from No 2 Nimurigaon under Dhalpur block and on 21<sup>st</sup> April, twelve person from Bhoripam village under Nowboicha block developed symptoms of fever, stomach pain and loose watery stool after taking mushroom. Stool samples were collected for culture and sensitivity test. Result showed normal growth of E coli. Case fatality rate 0%.
2. On 7<sup>th</sup> May, three adult male from Shalmari no 80 village under Bihpuria block developed similar complain due to same cause with a case fatality rate of 100%. Stool sample collected. Result showed normal growth of E coli
3. On 14<sup>th</sup> June, five person from Dhemagarh under Bihpuria block and on 20<sup>th</sup> June, four patients from Rupahi village under Boginodi block also developed similar complain due to same cause. Stool sample collected. Result showed normal growth of E coli. Case fatality rate 0%

In 2013 till now one outbreak of Mushroom poisoning cases were came into noticed

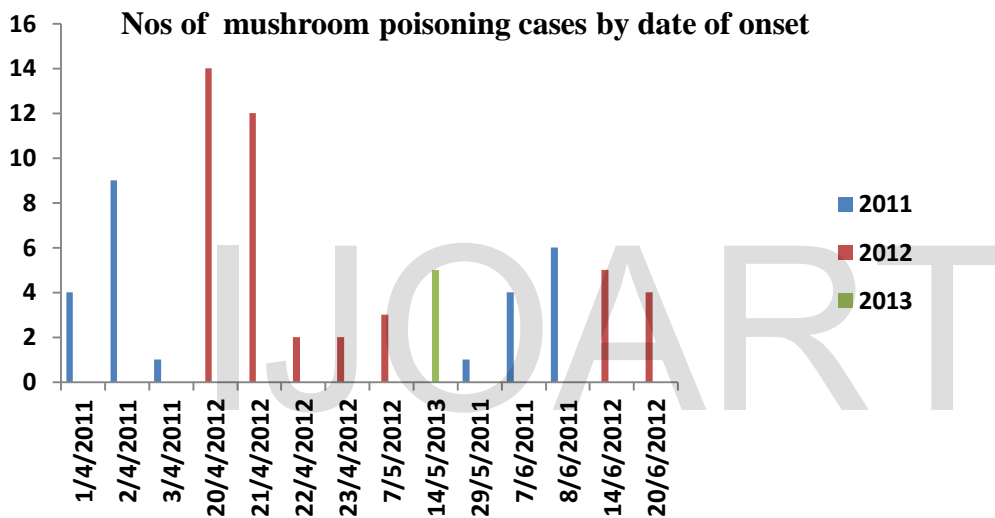
1. On 14/5/2013, Five nos. of patients started vomiting and suffered from stomach pain and dizziness after 2-3 hours of taking wild mushrooms in Simoluguri SHC under Dhalpur BPHC where two families were affected. After investigation it was found that the families are relatives and they took wild mushroom from the same source. Adult female are more affected. Case fatality rate 0%. Stool sample collected. Result showed normal growth of E coli.

Table 1: Block wise nos no outbreak and affected population of Mushroom poisoning cases in last three years from different location of Lakhimpur district of Assam

Block	Nos of Outbreak	Affected population (nos)	Death (nos)
Dhalpur Block	3	21	0
Bihpuria Block	3	21	10
Boginodi Block	2	10	0
Nowboicha Block	2	16	0

Result of LFT and KFT test which was done at pathology laboratory of North Lakhimpur Civil Hospital confirmed abnormal results in 74% of the patients. Analysis of Mushroom poisoning outbreak from last three years in Lakhimpur district showed in Dhalpur and Bihpuria block several times of Mushroom poisoning outbreak were accounted. Case fatality rate was utmost in Bihpuria block (Table 1). Incidence of Mushroom poisoning cases reached at peak level on 20-21<sup>st</sup> April, 2012 (Figure 1)

Fig 1: Nos of Mushroom poisoning cases by date of onset in different location of lakhimpur district from last three years



### Discussion:

Even though not everyone is interested in collecting mushrooms to eat, it is important to understand most have an important and beneficial role in the environment. The definition of "edible mushroom" is extremely difficult. In the present conception, a fungus species is considered edible if eating it causes no health disorders, provided it has been properly cooked. The most frequent form of mushroom poisoning is caused by a wide variety of gastrointestinal irritants (GI). Severe cases may require hospitalization. Treatment is largely supportive - helping the patient's body to eliminate what it's not equipped to handle. Recovery is complete, though a bout with severe gastro-intestinal distress may put one off ever eating

mushrooms again. If the gastrointestinal distress begins 6 to 24 hours after ingestion of the mushrooms, there is a possibility of a very serious toxicity from Amatoxins. GI onset of 4-11 hours with impaired kidney function could be due to Allenic Norleucine (2-amino-4, 5-hexadienoic acid). GI onset greater than 24 hours and up to 21 days could be due to Orellanine.

During collection of Wild Mushrooms one should be undertaken the following preventive measures

- Be sure of your identification-eat only kinds known to be edible.
- Do not eat mushrooms raw.
- Eat only mushrooms in good condition.
- Eat only one kind at a time and do not eat large amounts.
- Eat only a small amount the first time; even morels, generally considered to be excellent, may cause illness in some persons.

In our finding it was noticed that mixed growth of E. Coli & Staphylococcus aureus was found in two nos of patients out of total Sixty eight and rest are showed normal growth of E coli. These results indicated that E coli serve as a major causative agent. Abnormal LFT and KFT result also helps in detection of mushroom poisoning cases in near future. A less time consuming rapid test is proposed for detection of edibility of wild mushroom, through which we can detect the source of infection as soon as possible. It helps to give an early warning signal by which one can prevent an impending outbreak as well as case fatality rate.

#### **Actions to assist treatment and management:**

Prevention is best achieved by eating only commercially cultivated mushrooms, and identification of mushrooms is best left to experts. Mushrooms should be regularly removed from sites where children are routinely present. Education regarding the poisonous nature of wild mushrooms may act as a deterrent to careless mushroom foraging and ingestion. Firstly, make sure that you record the time from ingestion and the first evidence of symptoms. This is vital because symptoms of the most poisonous and deadly mushrooms may take a long time to develop. The time interval from eating the mushroom to noticing the symptoms may be as long as one to two days or even longer. Secondly, Mushroom hunters who are appropriately cautious eat only 1 type of mushroom and save a sample in a dry paper bag for later identification, if needed. Alternatively, if you have failed to keep specimens, make detailed notes about the specimens that have been eaten: habitat, size, colour, type of stem and stem base, gilled or other

forms of mushroom, morels, brackets, truffles. The more detailed the notes the better chance a mycologist will have of identifying the species that have caused the problems. Finally, around the time of eating the mushrooms had you drunk any alcohol? That day? The day before? Or the day after? Alcohol in conjunction with *Coprinus armamentariums* may cause a severe allergic reaction.

### **Conclusion:**

There are a total of ten outbreak of mushroom poisoning reported so far in different location of Lakhimpur district of Assam from last three years. Major grounds behind them were consumption of wild poisonous mushroom. Result of 90% of stool specimen showed growth of *E coli* as a causative agent. All age group and both the sexes were affected. Incidence was higher in Bihpuria BPC with an elevated case fatality rate.

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