

## REVIEW STUDY OF DESIGNER DRUGS; TRYPTAMINE

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### ABSTRACT

In the codification of quench, the ever-proliferating administrates the chemical or pharmacological substances only to satisfy their addiction in veliciously form such as psychological, speculate medical needs and become addict of drugs. These sculptures have adroitly modified and altered the pre-existing controlled substances into new and unique derivatives that mimics similar actions as that of their parent drugs. These new drugs can be called precursors of the controlled substances for having different or unique chemical structures which conveniently circumvents the strict guidelines of the Law Enforcement System. Tryptamine are hallucinogenic drugs (mind - altering or trippy drug) which changes one's perception about senses and reality. Tryptamine have been used increasingly over the years and cases related to serious health hazards, overdosage and death have been reported in the last decade. This study is carried out to understand TRYPTAMINE as a new aged trending designer drug.

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## INTRODUCTION

The production of drugs is used to cure the disease and prevent the life of humans. Along with the advancement of technologies, modifications have started in the structure of drugs. they have been used for recreational purposes as well. The chemical structure of drugs has been complicated resulting in greater effect on human mind and body<sup>1</sup>. The experiments on the chemical structure of drugs leads to the discovery of these designer drugs. Even small dosage of certain designer drugs can lead to high amount of mental and physical effects on the consumer's body. These drugs are mainly prepared by the mixing of a few drugs for which no prior testing is required anymore, therefore, their side effects are unknown to the human<sup>2</sup>. Some examples of designer drugs are: Ecstasy, LSD, Methamphetamine, Tryptamine etc. which mostly are used in clubs or night life parties and hence at times are also known as Club Drugs. To know a drug's dosage with respect to its effects on a human require laboratory testing<sup>3</sup>. Since these are illegal drugs hence, these do not undergo testing in laboratories to determine the range of effects, the time taken by them to effects a body, the side effects or their fatal dose. This results in cases where people who consume several drugs have health issues like memory loss, seizures, heart attacks, respiratory distress, palpitations and in severe cases may even go into coma or worse death<sup>4</sup>.

Tryptamine and its derivates have become one of the major drugs consumed by youngster's now a days. Its existence was

enlightened in 1999 and have been used extensively since then<sup>5</sup>. Tryptamine are found to be in different forms including, powder (white and colored), Liquid, which is soaked in paper chits and then consumed and Colored capsules / round mass. These can be taken orally in form of tablets or paper chits (blotters), mixed in drinks or food substances and non-orally such as by snorting, injections, or smoking. The motive behind abusing tryptamine is the addiction to explore new drugs which cause euphoria and pleasure. They show the effects such as euphoria (extensive excitement), hallucinations, heightened feelings and emotions. The low cost, easy availability and undetected in drug screening given this drug an advantage<sup>6</sup>.

### Classification of Tryptamine

Tryptamine was classified by Nichols and Fantegrossi into two main groups and three sub-groups. the main group classification is given as;

1. Simple Tryptamine: Containing Dimethyltryptamine (DMT)
2. Ergolines: Synthesized by fungus ergots including LSD, its structure consists of differential kaloids.

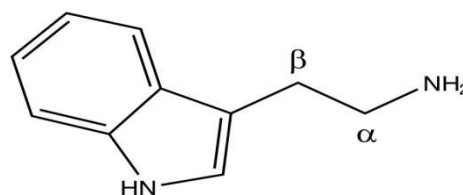


Figure 1 chemical structure of tryptamine.

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**The sub- groups of tryptamines are given below**

1. No substitutions (No modifications can be made to the structure)
2. 4<sup>th</sup> substituted (Modifications made to the 4<sup>th</sup> Indole ring position)
3. 5<sup>th</sup> substituted (Modifications made to the 5<sup>th</sup> Indole ring position)

While making the modifications to the 6<sup>th</sup> and 7<sup>th</sup> positions it was observed that hallucinogenic properties reduced.

**Derivatives of Tryptamine**

**AMT:** It is also known as Alpha-methyl tryptamine which initiates release of dopamine and serotonin. It has two main products which act as neurotransmitters. It is used to produce psychosis and is a toxic substance.

**Di-isopropyl -tryptamine (DiPT):** It is a synthetic drug and very well known to cause hallucinations.

**5-methoxy - Di-isopropyl tryptamine (5-MeO-DiPT):** It is called as Foxy Methoxy. It is a synthetic designer drug.

**5-methoxy-N, N-diallyltryptamine (5-MeO-DALT):** Activation of G-protein was observed in rat brains. After consumption, its effect starts within 15 minutes and reach at highest peak by 30 minutes<sup>7</sup>.

**Lysergic Acid Amide (LSA):** It belongs to Ergoline family and closely related to LSD. The seeds of *Argyrea nervosa* or *Ipomoea violacea* are crushed and used for oral administration. The drug starts in effect within 40mins and reached its peak in 4-6hours. It takes 1-2hours for a person to normalize from its effect<sup>8</sup>.

**Table 1** description of tryptamine derivatives along with dosage, effect on human health and time duration

No	Derivative	Administration	Dosage	Effect	Starting - lasting
1	AMT	Orally	15-30 mg	Irritability	3-4hrs to 12-48hrs
		Smoked	4-20 mg	Anxiety, Nausea, Vomiting, Hallucinations	0.30-3mins to hrs
2	DiPT	Orally	50-100mg	Hallucinations, Auditory distortions, Confussion	6-8hrs
3	5-MeO-DiPT	Orally	6-12 mg	Euphoria, Anxiety, Nausea, Diarrhea	20-30mins to 3-6hrs
4	5-MeO-DALT	Orally	12-25 mg	Amnesia, Euphoria, Hallucinations, Walking difficulties	15mins to 2-4hrs
5	LSA	Orally	3-6 g	Nausea, Panic, Anxiety, Vomiting, Paranoia, Dizziness	20-40mins to 5-8hrs

**Effects of Tryptamine on Human Health**

Tryptamine is a structure containing Nitrogen groups. It has parole ring linked with benzene ring joined with an amine group by two carbon chains, which has an unpleasant odor and effects CNS that as a resultant of it; changes in to sleep patterns, mood swings, body temperature and behavior. Changes in the behavior, deviation from the daily routine, acting different than usual and being distant from the friends and family can be said as a few visible signs of a person using drugs. Hallucination can be better explained as observed and experiencing imaginary things which doesn't exist but having the feeling of its presence in surroundings. The consumer mostly realizes the fear duration of the designer drugs, e.g. some people experience spiders crawling all over them or the devil is trying to kill them etc. On usage by people it has been reported that tryptamine produces psychotropic effects after 1 minute of intake. The components used to make the drug

comes clear and undetected to the screening and medical tests. Thus, causing false diagnosis and misleading treatment to the drug effected person<sup>10</sup>.

There are several factors that affect the influence of drug on the body such as Drug dosage, Mode of the administration (oral administration be it either in drinks or food items or injections or inhalation or transdermal), Consumed with or without alcohol, Weight and metabolism of the person, Age of the person, General health, Stomach contents etc. The person who is happy will have a feeling of good trip and the trippy sensation. The person who consumed medication or alcohol will have more effect and a long-lasting effect can even be deathly for the consumer. An unhealthy person might have severe problems in comparison of a healthy person. The more frequently, individual intake the drug; more dosage are required to their body leading to the addiction of drug<sup>11</sup>.

**Detection of Tryptamine-Derivatives**

Identification and detection of drugs is performed by observing blood, urine, liver, brain, kidney, and gastric contents samples with the help of headspace gas chromatography (GC/HS), gas chromatography mass spectroscopy (GC/MS) etc. In several cases where the victim is not deceased, the reports of body screening can presume undetected for tryptamine/derivatives in such situations. Whereas, the detection of drugs can be done by proper internal examination of the deceased by performing blood screenings for drugs, toxicological examination of bodily organs using different instruments.

**AMT:** In a reported case of over dosage, the examination was performed for AMT of urine, gastric contents, liver brain and blood vessels were observed. Enzyme Immunoassay was conducted for urine and gastric contents (required quantity 48g) and the results were found positive for amphetamines. A blood screening test was also performed for drug via GC/MS and AMT was resulted. In Post mortem examination, iliac blood vein, gastric contents liver and brain signs and symptoms confirmed overdose on AMT which was estimated the cause of death.

**5-MeO-DMT:** It was a case of 2005 in which death occurred by consumption of hallucinogenic herbs. During autopsy examination, both external and internal body organs were examined carefully. During the external examination, the presence of lividity (bluish colour of body) was confirmed, while toxicological examination was performed at blood, urine, gaits contents, kidney, brain and liver. Examination of urine sample confirmed the signs of Diphenhy dramine, while Mass Spectroscopic ally testing of blood and urine samples confirmed the results of 5-MeO-DMT.

**5-MeO-DiPT:** It was a case of Foxy in which the drugs route of administration was anal which disported agitation in abdomen. During the toxicological examination of autopsy, traces of 5-MeO-DiPT and its derivations were found in the blood and urine samples. To determine the cause of death by 5-MeO-DiPT, quantitative analysis was performed on Liquid chromatography - Mass spectroscopy.

**Table 2** Tryptamine detection time period from various biological evidences

<b>Urine</b>	24 hours
<b>Saliva</b>	1-5 days (after consumption)
<b>Hair</b>	3 months (if not a chronic user)
<b>Blood</b>	Easily exits body so unlikely to be found after 2 days of consumption

### **Post Mortem Findings -Caused by Tryptamine**

In some serious cases, tryptamine can be recovered from the decomposed dead bodies' tissues. Therefore, dead bodies should be preserved in an appropriate temperature without any delay to prevent the degradation of tissues or inexact detection of tryptamine/ derivatives. Since when it is very well known, that several forms of poisoning can lead to death of an individual. Firstly, it is acute poisoning that is intake of tryptamine / derivatives in a higher quantity within a short span. In such cases, traces of tryptamine cannot be observed in nails and hair follicles during post mortem examination. Whereas, when the person has been intaking the drug in short amount over a long period of time which is known as chronic poisoning, then the traces of tryptamine or its forms are visible in the nail and hair follicles<sup>12</sup>.

During the toxicological analysis, the concentrated body is examined including blood, brain, liver as well as the gastric contents are also examined. The blood, urine sample are collected mainly to test for the presence of drug. The blood is even extracted from the heart and tests are done on this blood to figure out the presence of and the amount of tryptamine present. if someone is suspected of having tryptamine poisoning, he/she can be easily detected by implementing gas chromatography, thin layer chromatography (TLC) and mass spectroscopy. Such analysis requires sensitive techniques to determine the quantitative analysis of consumed/administered drugs. Several advanced techniques such as Mass Spectroscopy (MS), Gas Chromatography (GC), GC-MS, High Performance Liquid Chromatography (HPLC), liquid Chromatography-tandem mass spectrometry, Ultra High-Performance Liquid Chromatography (UHPLC) are used. Any kind of delay in examination can lead towards inaccurate results of the findings.

### **CONCLUSION**

The increasing pressure of law enforcement and criminal penalties becoming more stringent has led to the availability of designer drugs quite difficult. The drugs e.g. tryptamine and its derivatives are consumed by various routes of administration and is used on several situations during which the person remains under the influence. Tryptamine and its derivatives are produced by changing the chemical structure of drugs. It is conducted to explore both medical and recreational grounds, like AMT which was used as anti-depression drugs until know to produce psychosis. The recreational usage of such drugs causes effects on the body and mind of the consumer. The drugs used recreationally are produced for the main purpose of euphoria, getting 'high' and to get away from reality to have a different experience. The medically used drugs are given with proper known dosage to avoid side effects and overdose whereas while recreational usage of drugs causes an individual to acquire drugs in fatal dosage. While acute dosage can cause immediate death by overdose, Moreover, chronic poisoning can lead to serious health hazards in the long run with shutting down of body and accumulation of drugs in the body parts (nails, hair). The consumption of drugs by woman during pregnancy can not only cause the consumer harms but even effect the unborn child leading to prolonged lifelong difficulties fatal and otherwise.

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**Ethical Consideration:** NA

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