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DELIBERATE SELF HARM USING ACETAMINOPHEN--CASE SERIES

Merin Elza Anil[1]*, Dr. Rekha G. Muricken[2], Dr. Anila Elizabeth Abraham[3], Dr. Elizabeth James[4] and Dr. Sunil Antony[5]

[1]Pharm D. Intern, Nazareth College of Pharmacy Othera, Thiruvalla, Kerala.

[2]Associate Professor, Department of Obstetrics and Gynaecology, Believers Church Medical College Hospital, Thiruvalla, Kerala.

[3]PG Resident, Department of General Medicine, Believers Church Medical College Hospital, Thiruvalla, Kerala.

[4,5]Associate professor, Department of General Medicine, Believers Church Medical College Hospital, Thiruvalla, Kerala.

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***Corresponding Author**
Merin Elza Anil
Pharm D. Intern, Nazareth College of Pharmacy Othera, Thiruvalla, Kerala.

ABSTRACT

Acetaminophen, a commonly available over-the-counter medication, is used by a significant portion of the population to injure themselves deliberately. The majority of cases don't result in death, although they can seriously damage the liver. The major treatment for this toxicity is N-acetylcysteine.[1] We describe a run of ten instances at our hospital over the past five years of persons purposefully ingesting paracetamol tablets and their management.

KEYWORDS: Acetaminophen, Intentional Self Harm, N-Acetylcysteine.

INTRODUCTION

In the developing world, intentional self-harm is a significant issue. Self-poisoning with drugs like benzodiazepines and antidepressants is prevalent in cities, but it seldom results in fatalities. Self-harm is sometimes considered to be a problem that only exists in industrialised nations. However, recent research has started to highlight its significance in the developing world. According to the Global Burden of Disease study, 593 000 individuals committed themselves in the developing world in 1990, accounting for 75% of all suicide fatalities worldwide.[2]

When used in accordance with the advised therapeutic dosage, the analgesic and antipyretic medication paracetamol (acetaminophen) is inexpensive, safe, efficient, well-tolerated, and has relatively few side effects. The medication is easily accessible over-the-counter in many nations without a prescription. Thus it is one of the most commonly employed medication for self-harm or suicide acts since it is readily obtainable and doesn't demand a prescription.[3] For adults, 650 mg to 1000 mg of acetaminophen every 4 to 6 hours is the suggested dose, with a daily maximum of 4 grams. Children's dosages range from 15 mg/kg every 6 hours to 60 mg/kg each day. Toxicity begins to manifest at 7.5–10 g/day, or 140 mg/kg.[4]

CASE 1

A 20 year old male patient admitted with alleged history of consumption of 8 tablets of 500mg paracetamol (cumulative dose 4g). He had drowsiness following the consumption. He was taken to a nearby hospital where gastric lavage was done and afterwards shifted to tertiary care hospital. On investigation, his initial blood counts showed a total count -6700. Liver function test reports were normal. Activated Charcoal 50g was given. There was no evidence of liver cell injury during the course of his hospital stay.

CASE 2

A 35 year old female patient came with an alleged history of consumption of 15 tablets of 500mg paracetamol (cumulative dose- 7.5g) following a quarrel with her husband. From then she was unresponsive, hence taken to a nearby hospital where she underwent stomach wash. Antiemetics and PPIs were also given and were referred to tertiary care hospital for further management. She was admitted to ICU for observation and was started on NAC as per the guidelines. Her liver function tests were found to be normal. The patient was clinically stable.

CASE 3

A 20 year old female patient with no comorbidities admitted to ICU with alleged history of consumption of 15 tablets of paracetamol 650mg (cumulative dose-9.7g) at her residence following some personal family matters. After consumption , she had complaints of epigastric pain and multiple episodes of vomiting. She was initiated on NAC infusion. Initial investigations showed deranged LFT in which SGOT and SGPT were highly elevated. Her PT/INR were also elevated. Daily LFT monitoring was done which showed a very high SGOT and SGPT, given an impression of Acute hepatic failure. Gastroenterology consultations were obtained and they advised to continue management with NAC, Inj

Vitamin K and hepatoprotective agents. Later on, she was clinically better with LFT values normalised.

CASE 4

A 17 year old female, with no known comorbidities with alleged history of intake of 16 tablets of paracetamol 500 mg (cumulative dose-8g) and was taken to nearby hospital, there gastric lavage done and NAC was given. She was referred to tertiary care hospital for further management. Her routine blood investigations were unremarkable. Urine routine shows bacteriuria. She was managed with NAC infusion from ICU and was shifted to ward once she became stable. Psychiatry consultation was sought and their suggestions were followed. During the course in hospital stay, she was treated with IV fluids, antioxidants, gastroprotective and other supportives. Regular monitoring of vitals was done. Patient responded to the given medications, symptomatically better, hence discharged.

CASE 5

A 21 year old female with no known comorbidities alleged with h/o 30 tablets of paracetamol 500 mg (cumulative dose-15g) consumption. She was initially taken to nearby govt hospital where they did gastric decontamination and referred to tertiary care hospital for further evaluation and management. Her initial blood investigations were within normal limits. She was treated Inj. NAC, PPIs and other supportive measures. Psychiatry/ Psychology consultation done and advised DBT. Urine routine showed bacteriuria, thus started with antibiotics T. Niftas. USG abdomen and pelvis done was normal. Gastroenterology opinion sought and their advice followed. She was symptomatically better and stable, hence discharged.

CASE 6

A 18 year old female patient with no known comorbidities alleged with history of 11 tablets of paracetamol 500mg (cumulative dose-5.5g) consumption, in the ED, she was given stomach wash and N acetyl cysteine infusion was started. Routine blood investigations were unremarkable. Liver parameters were closely monitored for derangement and there was no evidence of any.N acetyl cysteine infusion was continued in the ICU and laxatives were also given. As her general condition became better, she was shifted out from the ICU. Psychology consultation was sought and supportive work up was done. She is planned for psychotherapy on OPD basis. As the patient is clinically and symptomatically better, she is discharged.

CASE 7

A 21 year old female patient with known complaints of asthma (on inhaler)was brought to hospital with an alleged history of 10 tablets of 650 mg paracetamol (cumulative dose -6.5g) consumption due to exam stress, later she had complaints of abdominal pain , one episode of vomiting and headache. Her initial blood investigations were found to be normal. Gastric lavage done initially by 50g activated charcoal. LFT were also in normal ranges. After RT insertion greenish secretions were seen. She was started on IV fluids, PPIs and intravenous N- acetyl cysteine. Psychiatry consultation was sought for paracetamol overdosage and they advised psychotherapy. Clinical psychology consultation was sought and psychotherapy was given.

CASE 8

A 16 year old female patient came to ED with an alleged history of Paracetamol tablet intake of 15 tablets (9g) as she had excessive stress due the quarrel between her mother and father. She took 10 tablets of Paracetamol 650 mg and 5 Paracetamol 500 mg tablets. She developed dizziness and confessed to her uncle regarding ingestion after which she was taken to hospital. She was started on NAC Infusion and IV fluids. During the stay , she had complaints of vomiting and dizziness. Patient bystander requested for discharge to which consultants counselled about the delayed reaction of poisoning to them. But they insisted on getting discharged as the patient had her exams. Thus the patient was discharged against medical advice.

CASE 9

A 25 year old female patient came to the emergency with an alleged history of ingestion of paracetamol tablets (approximately 10 tabs of 650 mg dose) at around 11 pm at home following an argument with husband. She was soon taken to a local hospital where she was given gastric decontamination with activated charcoal. Injection NAC loading dose was given and referred to our hospital for further care. No history of altered sensorium , chest pain , vomiting or breathlessness. Routine blood investigation was done and showed normal total counts. Serum electrolytes were within normal limits. Her liver function tests were normal except for a slightly elevated bilirubin. She also had a slight increase in INR levels. N acetyl cysteine infusion was continued (Inj N Acetyl Cysteine 4200 mg in 500 ml NS over 4 hours and then N Acetyl Cysteine 8400 mg in 1000 ml NS over 16 hrs). She was also given

gastroprotective drugs. Psychiatry and psychology consultation was sought and counselling was given. Patient is symptomatically better, hence is being discharged.

CASE 10

A 35 year old female was referred from District hospital -history of intake of 4 paracetamol tablets 500mg (2g) at around 11 :30 am following which she developed generalised tiredness, nausea and shivering.She was initially taken to district hospital, where RT aspiration was done and the samples were collected. No history of vomiting, abdominal pain and altered sensorium. She is a k/c/o Varicose veins and Right breast lump. Her initial routine blood investigations showed normal total counts with polymorph predominance. She had anaemia (Hb-8.7). Her electrolytes level, LFT, RFT were within normal limits. She was given an antidote for paracetamol poisoning(tab.N acetyl cysteine 600mg). Her LFT levels and vitals were serially monitored. During her course of hospital stay she was treated with IV fluids, gastroprotectants, iron tablet and other supportive measures. As she is hemodynamically and metabolically stable, she is discharged.

DISCUSSION

Deliberate self harm refers to intentionally causing physical harm to oneself to inflict bodily damage. Drug overdose and hanging are the two methods commonly used for deliberate self harm according to studies from South India.

Paracetamol is readily absorbed from the small intestine. Peak serum concentrations are achieved in 1-2 hours for normal tablet or capsule formulations and in 30 minutes for liquid solutions. Peak serum concentrations following therapeutic dosages rarely surpass 130 mol/L (20 mg/L). Twenty percent of the ingested dosage is metabolised in the gut wall on the first pass. Standard preparations are typically distributed within 4 hours after intake and liquid preparations within 2 hours. The distribution volume is 1 L/kg. Hepatic biotransformation is used for further elimination. The elimination half-life after therapeutic doses is 1-3 hours. Approximately 90% is converted to inactive sulphate and glucuronide conjugates, which are eliminated in the urine.[3]

Metabolism primarily occurs through glucuronidation and sulfuration, which occur in the liver. When these pathways are exhausted due to an overdose, additional acetaminophen is metabolized into NAPQI (a poisonous chemical that is safely reduced by glutathione to harmless mercaptate and cysteine molecules by cytochrome P450) and subsequently

eliminated through the kidneys. When glutathione levels decline below 30% of normal owing to an overdose, NAPQI levels rise and then bind to hepatic macromolecules, leading to irreversible hepatic necrosis.[5]

According to our study, 9 out of the 10 subjects were female and the age of the subjects were between 16 years and 35 years. Family issues, stress, financial crisis are some of the contributory factors which led them to do paracetamol induced DSH. The cumulative dose used by the subjects for the same ranges from 2 g to 15g. (4) Only one of the ten people studied (out of 10) experienced acute liver damage.

When compared with western populations, paracetamol induced hepatotoxicity rate was lower among Asian populations. Cumulative dose of paracetamol, Dose of NAC, Alcohol coingestion in western patients, variation in the timing of NAC administration are the factors which might contribute to low rates of paracetamol induced hepatotoxicity among Asian populations.[6]

There is an emerging need for psychological programs to be initiated at community level for the development of interpersonal skills especially among young people to cope up with the challenging situations which might come in life.[7]

Preventing the intentional self harm caused by the commonly available over the counter drug Acetaminophen or atleast of its consequences is a complex as well as a challenging issue. Limiting the ease of availability by reducing the number of tablets available over the counter without prescription helps to save the life of many from overdosing. It might be an initial strategy to solve the problem of paracetamol induced self harm.[8]

CONCLUSION

Paracetamol has been misused for self-harm since it is a medication that is readily available and accessible. Communities should start appropriate psychological initiatives to foster interpersonal abilities to handle challenging circumstances. Additionally, it can be decreased by restricting the quantity of over-the-counter tablets that are available.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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ABBREVIATIONS

PPI- Proton Pump Inhibitors

ED - Emergency Department

LFT–Liver Function Test

RFT–Renal Function Test

SGOT– Serum Glutamic Oxaloacetic Transaminase.

SGPT–Serum Glutamic Pyruvic Transaminase.

PT- Prothrombin Time

INR-International Normalised Ratio

DBT–Dialectical behaviour therapy

RT – Ryle's tube

NAPQI - N-acetyl-p-benzoquinone imine

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