

A Case Study on Carbon Monoxide Poisoning Due to use of Gas Geysers in Bathrooms

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Abstract

To bring to light the greatly hazardous effects of the use of flue less gas geysers in the domestic setting. This article highlights the dangers and illeffects of using gas based geysers in the domestic setting. Over a period of 3 months 3 cases were seen in ER of Max Hospital which were suspects of CO poisoning due to use of gas geysers with unexplained neurological events while bathing in an ill ventilated bathroom with a functional flue less gas geyser. To increase awareness regarding gas geyser induced epilepsy and associated carbon monoxide intoxication, both of which are entirely preventable conditions. We also wish to emphasize the importance of stringent and universal implementation of gas geyser usage and installation laws.

Keywords: Carbon monoxide; Epilepsy; Gas geyser.

INTRODUCTION

India is a developing country with a large population and a large fraction of it under the poverty line with low per capital income.

There fore there is a huge demand for power resources and not every place has a good electric supply. As a result of which gas based geysers have gained popularity in many such area. But there have been reports of neurological events in areas

using gas geysers.

Sudden loss of consciousness in the bathroom can be due to a number of causes like

- Seizures
- Head injury
- Stroke w
- Cardiac events
- Syncopal episodes due to various poisonings and toxin exposures.

Such an episode is highly distressing and may have long lasting or even life threatening after effects. In a recent study, 26 cases of unexplained neurological collapse in bathroom were reported, that presented as seizure like episode, carbon monoxide intoxication and epileptic event.

These events can be explained by exposure to high amounts of various toxic gases, mainly carbon monoxide released as a result of incomplete combustion of LPG in gas geysers in small ill ventilated bathrooms in homes.

These events can be prevented by increasing awareness about gas geysers and how to use them and their ill-effects.

CASE REPORTS

Case 1

20 Yrs old female brought to er with h/o sudden onset chest pain and then?

Syncope? Seizure and fell down in the bathroom.

Was taken out from the bathroom where she was lying unconscious and had passed stools and urine.

No H/o Fever/Vomiting

No H/o Previous Heart Disease

No H/o Any Seizure in the Past

No H/o Any Intake of Drug

No H/o tongue bite

On arrival in er, pt regained consciousness

LMP: 13 DEC, 2018

Primary Survey Findings:

Airway Assessment: Patent Breathing Assessment

Respiration(Rr/Min): 12/min regular

Laboured: No

wSpo₂: 100% On Room Air Circulation

Pulse: 126/Min Regular

BP: 100/60 MmHg

Peripheral Pulses: +

Temperature: 98.3 Degree F

Cardiac Monitor: NSR (Normal Sinus Rhythm)

Grbs: 112 Mg/Dl

Ecg: Sinus Tachycardia with ST Depressions in V 1, 2, 3, 4, 5

Pupils:

Right Eye: 3 Mm, Reactive To Light

Left Eye: 3 Mm, Reactive To Light

Secondary Survey Findings:

Review of Systems:

Heent:

Pallor:

Icterus:

Cyanosis:

Jvd:

Tongue/Mucuous Membranes: Moist

Chest: B/L Clear

Cvs: S1 S2 Normal

Abdomen: Soft

Neuro: Pt Now Conscious, Obeying Commands B/L Plantar Flexor Power All 4 Limbs 5/5

Extremities: Warm

Ample History:

Allergies: No Known Allergies

Medications: Not On Any Medications

Past Medical History: Not Significant

Last Meal Taken: Morning Tea

Events Prior To The Incident: Non Significant

Provisional Working Diagnosis (After Initial Assessment):

? ACS

? Syncope

? Seizure

? Co Poisoning

Investigations (Labs/Radiological Imaging):

Planned To Be Done

ECG

RBS

Cardiac Markers

U P T

Mr Brain Stroke Protocol

Treatment Advised in the Ed:

- IV Fluid NS 500 ML
- Inj. Levepil 1 Gm IV Stat

Mri Brain Reports - No Abnormality Seen

Patient was admitted and was followed up for 2 days then discharged without any residual symptoms

Case 2

Source of Information: Patient

Scanning Required: No

Presenting Complaints:

Pt came in er with presenting complaints of dizziness and ghabrahat.

Pt had episode breathing difficulty followed by dizziness and then.

She found unresponsive in bathroom according to patient attendant was.

Taken to local hospital. She had CLW over forehead & sutured there and was discharged.

Patient again C/O dizziness After detail H/O attendants give H/O use of gas geyser at home in bathroom.

H/O shortness of breath in the past

No H/O chest pain, fever, vomiting

Historian: patient, family

Primary Survey

Airway Assessment: Patent Breathing Assessment

Respiration (Rr/Min): 14

Laboured: No

Spo2: 99% On Room Air wCirculation

Pulse: 91/Min, Regular

Bp: 100/60 Mmhg

Peripheral Pulses: Yes

Temperature: 98.3

Grbs: 107Mg/Dl

Ecg: Nsr

Pupils:

Right Eye: NSNR

Left Eye: NSNR

Secondary Survey

Review of Systems Heent:

No Pallor/Icterus/
Cyanosis

Chest: B/L A/E + No Added Sound

Cvs: S1, S2+

Abd: Soft, Non Tender, Bs+

Ext: No Edema

Neuro: Consious, Oriented

Ample History

Allergies:

Medications: Not Taking Any Medicines

Past History: Not Significant

Working Diagnosis: Syncope U/E
? Seizure
?Co Poisoning

Investigations:
CBC, LFT, KFT, S.ca2+, S.mg 2+, M R Brain
AB, ECG, RBS

Treatment Advised:
-INJ Pantop 40 Mg IV Stat
-INJ Emset 4Mg IV Stat
-NS IV Fluids @ 60ML/HR
MRI Shows No Abnormality Seen

DISCUSSION

Gas geysers are cheap and easy to get as a result of which there has been mass usage of it in Indian household.

However there's are hardly used and set as recommended and people hardly pay any attention to guidelines regarding its use.

The incomplete cumbustion of LPG in theses geysers in I'll ventilated bathrooms leads to accumulation of carbon monoxide.

Clinical features of carbon monoxide poisoning are:

- Headache
- Dizziness
- Confusion
- Coma
- Seizures

Magnetic resonance imaging is the investigation of choice for suspected CO poisoning seen as

symmetrical T2 hyper intensities in the basal ganglia.

However, only symmetrical affection of the globus pallidus may also be seen. Depending on the type of flue (vent) system used gas geysers are of following types:

1. Room sealed (balanced flue)
2. External flue

Flue less (Room-sealed (balanced-flue) gas water heaters are the first choice for new installation. Fresh air for combustion and combustion products are taken from and discharged directly to outside air, without contaminating room air.

Flue less gas water heaters are considered dangerous if used to supply hot water to a bath or shower, because the products of combustion containing CO, discharge directly into the room, and may build up to dangerous levels.

There are guidelines for using it:

1. Do not operate this appliance before reading the instruction (user guide) booklet.
2. Do not place articles on or against this appliance.
3. Do not store chemicals or flammable materials, or spray aerosols near this appliance.
4. Do not operate with panels, covers or guards removed from this appliance.
5. Do not operate in a bathroom or bedroom.
6. Do not operate in an unventilated room.
7. Do not operate in a room with volume less than (a value dependent on heater capacity).
8. Emissions from this space heater may affect persons susceptible to respiratory problems.

CONCLUSION

The main purpose of this article is to increase awareness on gas geyser induced epilepsy and associated carbon monoxide intoxication, both of which are entirely preventable conditions.

Flue less gas geysers are proving to be the 'modern day gas chambers' with the stark contrast that these geysers are installed willingly and in good faith by innocent consumers.

We also wish to make an effort towards the implementation of stringent policies for gas geyser installations in India or any other place where these gas appliance installation laws are being freely flouted or are not existent.

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