

# Dust Off Huffing: Emerging as a New and Cheap Form of Abuse and a Cause of Different Types of Arrhythmias with Transient Multiorgan Failure

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# Dust Off Huffing: Emerging as a New and Cheap Form of Abuse and a Cause of Different Types of Arrhythmias with Transient Multiorgan Failure

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## Background

- 1, 1-Difluoroethane [DFE, Freon 152a], an organofluorine compound is a colorless gas found in “Dust off”, a refrigerant based propellant cleaner [which is a popular brand ] intended for blowing dust off electric devices.
- The intentional inhalation of the fumes from gasoline or solvents for recreational purposes is commonly known as “Huffing”(Anderson and Loomis in Am Fam Physician 68(5):869-874, 2003)
- It is easily available to an extent that you probably could randomly walk into 10 office settings or a random house with electronic devices, in any part of the United States, and each one would have multiple cans of Dust-Off.
- Of concern is that it is emerging as a fatal substance of inhalant abuse especially among teenagers to induce instant euphoria and its potential to cause fatal cardiac arrhythmias, multi organ failure and death in many cases even with first use.
- It is a cheap alternative to other expensive drugs of abuse, very easily available and accessible. These characteristics make this form of abuse even more dangerous.

## Case Presentation

- We report a 33 year old white male who was found obtunded in a parking lot with 15 cans of “Dust Off” which he later admitted to be huffing as they are cheap alternative to other drugs of abuse.
- He was transferred from outside hospital with the above presentation, to our Burns unit initially due to frost bite injury to his hand caused as a result of holding “dust off” cans.
- Past medical history was significant for depression, seizure disorder, alcohol abuse and huffing issues.
- While in the burns unit, 5 minutes into his admission a code blue was called as he lost pulse. During the initial resuscitation the predominant rhythm identified was “Torsades de pointes” and he was treated with intravenous magnesium.
- The patient coded thrice with loss of pulse before he was successfully resuscitated, intubated and later transferred to cardiac intensive unit for further management.
- Later the patient developed right bundle branch block which was noted on telemetry and overnight he had profound hypotension, diagnosed with Cardiogenic shock requiring 3 inotropes to maintain a MAP>65.
- Emergent 2D ECHO done showed severely reduced left ventricular function with EF of 25% and global hypokinesis. Urine drug screen was negative and ethanol level undetected.
- Next day the patient developed Acute fulminant liver failure with the liver function test as shown in the table. Acetaminophen and salicylates were negative and he also developed Acute kidney injury with renal function test shown again in the table.
- The other subsequent transient EKG findings noted were ST segment changes consistent with Inferior wall ischemia and Sinus tachycardia.
- He also developed seizure like activity and EEG showed triphasic waves consistent with metabolic encephalopathies. MRI head showed Mild nonspecific periventricular and subcortical white matter disease differential for which was demyelination.

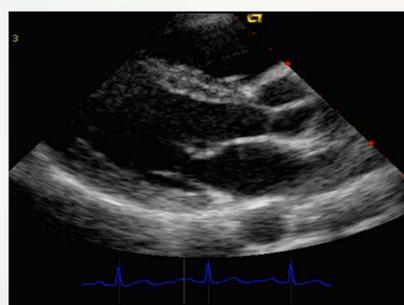
Lab	Value
Sodium	138
Potassium	3.5
Bicarbonate	16
Anion gap	19
BUN to Creatinine	20/1.55
Fractional Excretion of Sodium (FeNa)	1.13%
AST	17,202 (H)
ALT	8,659 (H)
INR	2.8 (H)
Creatinine Kinase	5058
Troponin 1-2-3	19.80 - 17.00 - 20.80
MCKMB	23.6
Urine drug screen	Negative
Alcohol	Undetected
Salicylate+Acetaminophen level	Negative

Different Arrhythmias Noted



Torsades de Pointes

Echocardiogram Finding of Cardiomyopathy



## Discussion

- Inhalant abuse is known to be “cardio-toxic” causing Sudden death, Acute transient toxic myocarditis and Chronic myocardial damage with repeated use.
- It causes myocardial degenerative changes like inter fibrillary edema, swollen and ruptured fibrils, congestive heart failure from chronic myocarditis and fibrosis.
- Another common manifestation of toxic myocarditis is Acute global LV systolic depression as evidenced in most of the cases.
- The most common cause of Sudden sniffing death is cardiac arrhythmias. Apart from ventricular fibrillation, sinus bradycardia, hypoxia induced block have also been noted.
- Evidence suggests that inhalant such as fluorocarbons “sensitize” the heart so that ventricular fibrillation can be triggered by events that would normally be harmless, unfortunately as evidenced in our patient.
- The point to stress is the easy availability of such a dangerous substance of abuse and its potential to cause fatal cardiac arrhythmias, multi organ failure and sudden death even with first time use.
- Inhalant abuse is an ongoing concern in United States especially among healthy teenagers as cheap source of instant euphoria, with several deaths and permanent disability reported in otherwise healthy youngsters.
- To prevent death from inhalant abuse the danger of sudden death should be announced , parents should be educated about recognizing high risk behaviors among their children and it is necessary to continually collect data on the number of patients with symptoms associated with huffing in clinical medicine and the number of deaths due to the same by testing for volatile gases in forensic autopsies and toxicological analysis.
- In this case however, the patient recovered in spite of multiple cardiac arrests and multi organ failure, which is a rare occurring.

## Follow Up

- The patient showed dramatic improvement with supportive care with the Liver and renal function returning back to baseline and subsequent repeat ECHO showing normal EF of 55%.
- He completely recovered in terms of his multi organ failure and was discharged home in a stable condition.
- On complete psychiatric evaluation the patient admitted to “dust off ” huffing for several months as they were cheaper alternative to other drugs and alcohol, legal and easily available.

## References:

1. Rohan Samson, Herman Kado and Douglas Chapman. “Huffing- Induced cardiomyopathy : A case report”. Cardiovasc Toxicol (2012) 12:90-92.
2. Joseph Avella, James C.Wilson and Michael Lehrer. “Fatal cardiac arrhythmia after repeated exposure to 1,1-Difluoroethane(DFE)”. The American Journal of Forensic medicine and pathology, Volume 27, Number 1, March 2006.
3. Cara Brown and Gavin Budhram. “Evaluation of left ventricular function by bedside ultrasound in acute toxic myocarditis”. The journal of emergency medicine, volume 45, pp-588-591, 2013.
4. Kentaro Sakai, Kyoko Maruyama-Maebashi, Akihiro Takatsu, Kenji Fukui, Tomonori Nagai, Miwako Aoyagi, Erika Ochiai, Kimiharu Iwadate. “Forensic science international”. Doi:10.1016/2010.08.026.