



Accidental Ingestion of Desiccants and Oxygen Absorber

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Background

- Desiccants
 - Silica gel
 - Calcium oxide
 - Activated clay
 - Molecular sieves
- Oxygen absorber
 - Ferrous iron based
- Limited data in literature concerning accidental ingestion of desiccants and oxygen absorber

Silica Gel: Non-Toxic Ingestion with Epidemiologic and Economic Implications

Ophir Lavon MD^{1,2,3} and Yedidia Bentur MD^{1,3}

Desiccant-Induced Gastrointestinal Burns in a Child*

Joshua G Schier MD, Robert S Hoffman MD, Lewis S Nelson MD
NYC Poison Control Center, 455 First Ave, Room 123, New York, NY 10016

Vet Human Toxicol 44 (6) December 2002

Desiccant-Induced Esophageal Obstruction: An Emerging Patient Safety Issue

Jodie A. Barkin, MD, and Jamie S. Barkin, MD, MACG

ACG Case Reports Journal | Volume 2 | Issue 2 | January 2015



Objectives

- To characterize the clinical features of desiccants and oxygen absorber ingestion
- To identify predictors for development of symptoms after ingestion



Study design and setting

- Retrospective observational study
- Electronic patient records derived from the database of Hong Kong Poison Information Centre (HKPIC)
- From July 2008 to March 2017



Data collection

- Demographic data, reason of exposure, amount and type of agents ingested, post-ingestion time at presentation and presenting symptoms



Inclusion

- Patients with history of desiccants and oxygen absorber ingestion



Exclusion

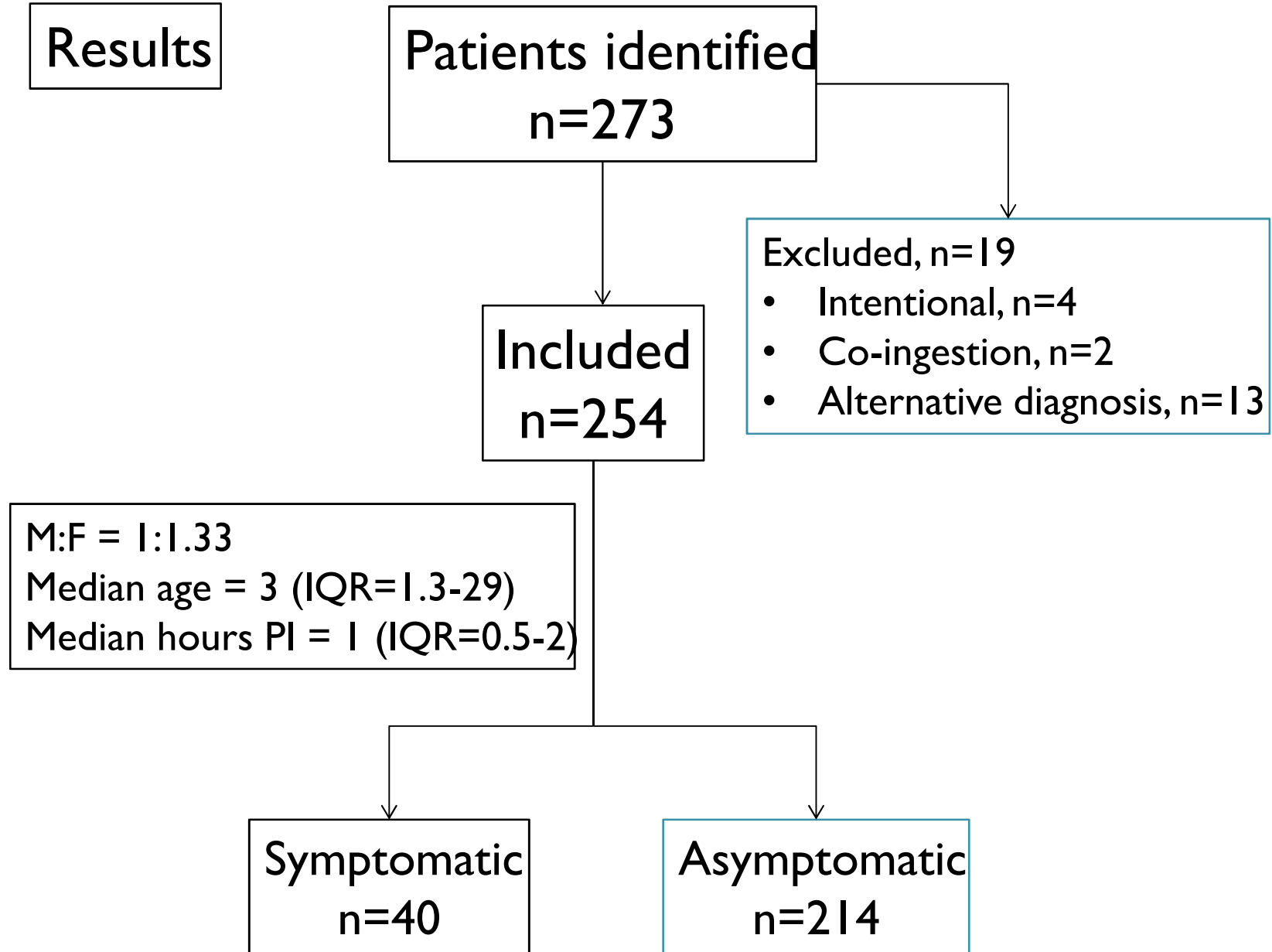
- Intentional ingestion
- Co-ingestion of other agents
- Alternative diagnosis accountable for the presenting symptoms



Statistical analysis

- Chi-square test or Fisher's exact test for categorical variables
- Student's *t*-test for continuous variables
- Multivariate analysis using backward stepwise logistic regression
- Two-tailed P value of <0.05 is considered statistically significant

Results




	Symptomatic n=40 (%)	Asymptomatic n=214 (%)	Total n=254 (%)
Age (mean)	27.13	16.44	18.13
Male (%)	12 (30)	97 (45.3)	109 (42.9)
Female (%)	28 (70)	117 (54.7)	145 (57.1)
Post ingestion time (mean hrs)	2.91	2.20	2.31
Type of agent			
Silica gel	15 (37.5)	143 (66.8)	158 (62.2)
Oxygen absorber	9 (22.5)	42 (19.6)	51 (20.1)
Calcium oxide	6 (15)	6 (2.8)	12 (4.7)
Others	0	6 (2.8)	6 (2.4)
Unknown	10 (25)	17 (7.9)	27 (10.6)

Clinical features

Symptoms	No. of patients (% of patient, n=40)
Oropharyngeal irritation	15 (37.5%)
Vomiting	15 (37.5%)
Abdominal pain	12 (30.0%)
Nausea	5 (12.5%)
Dysphagia	1 (2.5%)

*Some patients had more than one symptom

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- 3 patients had OGD performed
 - No significant complication
 - Others were given symptomatic treatment

Univariate analysis

Variables	P value
Age	0.018
Sex	0.072
Post-ingestion hour	0.351
Type of agent	
Silica gel	<0.001
Oxygen absorber	0.677
Calcium oxide	0.001
Unknown	0.001
Others	0.594

Logistic regression analysis

Variables	Odds Ratio	95% Confidence Interval	P value
Silica gel	0.373	0.177-0.785	0.009
Calcium oxide	4.574	1.240-16.864	0.022



Discussion

- Calcium oxide desiccant ingestion is predictive of symptoms development
- Silica gel ingestion is associated with absence of symptoms
- Further investigations and observation if presenting symptoms are not consistent with the type of agents ingested



Discussion

- Unknown type of desiccant is associated with development of symptoms
- Consider testing the pH of dissolved desiccant, an alkaline pH is suggestive of calcium oxide desiccant



Limitations

- Cases not reported to HKPIC were not included
- Reliance on the history provided on the presenting symptoms and the type of agents ingested



Thank you!