

Reactive airway dysfunction syndrome in Ireland

Dear Editor,

Reactive airway dysfunction syndrome (RADS) is a form of asthma first described by Brooks et al.¹ Original criteria for RADS diagnosis included no preceding respiratory disease, symptoms occurring following single exposure, inhalation of concentrated irritant smoke or fumes, cough, wheeze and breathlessness, function tests featuring airflow obstruction and positive methacholine challenge. We describe seven cases of RADS encountered since our original report of the first case of RADS in Ireland.² We include four cases featuring new irritants not previously reported.

A 32-year-old male trucker (see Table 1, case 1) loaded drums containing ethanol, isopropanyl and gingerine. A drum valve leaked and he detected an acrid smell while closing the valve. Immediately he felt unwell with chest pain, wheeze and breathlessness. A diagnosis of asthma was made. Sixteen months later, he remained on anti-asthma medications and still had chest discomfort and wheeze. Pulmonary function tests showed classical asthma patterns.

A 41-year-old male (see Table 1, case 2) had an acute inhalation injury, after exposure to a liquid (propionic acid, ammonium hydroxide and sorbic acid) sprayed on fish-processing machines. He developed a cough and chest tightness. His doctor prescribed anti-asthma medication. His symptoms were exacerbated by exposure to fumes, hay, dust and smoke. Function tests revealed typical reversible airflow obstruction.

Since Brooks' original description, more cases have been described in various settings.³ Our present cases extend the spectrum of causes of RADS to exposure to: (a) ethanol, isopropanyl and gingerine; (b) propionic acid, NH₄ and sorbic

acid; (c) burning rubber; and (d) sewerage gas. It confirms that most spillages occur indoors where toxic inhalation is concentrated. All of our patients had symptoms over a follow-up period of 17.6 months (range 6-36 months) suggesting long-term persistence of RADS. This and the low group mean age (41 years) has significant socioeconomic and vocational ramifications. RADS induction is attributable to acute airway inflammation provoked by non-sensitising chemicals. Brooks has suggested that inflammation may persist long term, given the intensity of the respiratory inflammation and subsequent dysregulated re-epithelisation and re-innervation. It must be emphasised that such accidents are preventable by appropriate industrial hygiene and better respiratory protection.

AM McLaughlin, E MC Kone, MX Fitzgerald
Department of Medicine and Therapeutics, St Vincent's
University Hospital, Elm Park, Dublin.
Email:muiris.fitzgerald@ucd.ie

References

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Table 1. Presentation of seven cases of RADS

Age & Sex	Exposure	Asthma symptoms	Asthma therapy	Peak flow (l/min)	FEV1 (l)	FVC (l)
32m	Ethanol, isopropanyl & gingerine#	Yes	+	550/620*	3.95/4.65*	5.1/5.45*
41m	Propionic acid, NH ₄ & sorbic acid	Yes	+	490/620*	4.5/4.7*	5.3/5.7*
39m	Rubber fumes	Yes	+	570/600*	2.9/3.2*	3.5/3.7*
64f	Sewerage gas	Yes	+	190/200*	0.9/1.1*	1.4/1.7*
39m	Ammonia	Yes	+	350/650*	3.5/3.7*	2.9/3.2*
43m	Chlorine	Yes	+	485/560*	4.0/4.4*	4.2/4.95*
31m	Chlorine#	Yes	+	695/710*	4.7/5.2*	6.3/6.6*

#Exposure occurred outdoors.

* Pulmonary function indices after bronchodilators