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Risperidone-Induced Acute Laryngeal Dystonia: A Case Report

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Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia**Corresponding Author:** Majid A. Alsalamah, e-mail: malsalamah@gmail.com**Conflict of interest:** None declared**Patient:** Female, 28-year-old
Final Diagnosis: Acute laryngeal dystonia
Symptoms: Shortness of breath
Medication: —
Clinical Procedure: Benzotropine administration
Specialty: General and Internal Medicine • Psychiatry**Objective:** Unusual clinical course**Background:** Antipsychotic medications are associated with multiple adverse effects, including metabolic syndrome, prolonged QT interval, and extrapyramidal symptoms. Acute laryngeal dystonia (ALD) is a rare and lethal form of extrapyramidal reaction.**Case Report:** A 27-year-old woman with schizophrenia on risperidone presented to our Emergency Department with a sensation of choking and respiratory distress, mimicking a panic attack. She developed a generalized dystonic reaction in the hospital, leading to diagnosis risperidone-associated ALD as a cause of her initial problems. She was discharged with an emphasis on being compliant with anticholinergic medication. However, her persistent respiratory symptoms prompted us to revisit the management plan. Her risperidone dose was tapered down to discontinue and an alternate drug was chosen.**Conclusions:** ALD must be considered as a differential diagnosis when patients on antipsychotic medications present with respiratory distress. Our case highlights the association of ALD with an atypical antipsychotic agent, risperidone. Prompt recognition of this entity is necessary to prevent complications and guide definitive management.**MeSH Keywords:** Drug-Related Side Effects and Adverse Reactions • Dystonic Disorders • Laryngeal Diseases**Full-text PDF:** <https://www.amjcaserep.com/abstract/index/idArt/922393>

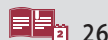
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Background

Acute dystonia is estimated to occur in 3–20% [1,2] of patients who use antipsychotic medication. These dystonic reactions can involve any groups of muscles, thus accounting for its variable clinical presentation (e.g., oculogyric crisis, torticollis, trismus, and opisthotonos). Most dystonic reactions occur during the first 3 days of therapy [3]. Identifiable risk factors for acute dystonic reaction include male sex, young age, history of previous dystonic reaction, and recent increase in dosage [4,5].

Acute laryngeal dystonia (ALD) was first described in 1958 by Christian et al. [6]. A correlation between ALD and sudden death was confirmed in 1981 after the first report of ALD-associated fatality [7]. Multiple case reports followed describing the relationship between ALD and use of multiple typical and atypical antipsychotics, some of which have proved to be deadly [8]. Traditionally, atypical antipsychotics are thought to have a lower incidence of extrapyramidal symptoms (EPS), but they are not all equal. In a meta-analysis, risperidone was found to have the highest association with EPS among atypical agents [9].

In this article, we report a case of risperidone-induced ALD presenting with acute onset shortness of breath, initially misdiagnosed as a panic attack, leading to a delay in management.

Case Report

A 27-year-old woman presented to our Emergency Department (ED) complaining of shortness of breath that developed acutely over the last 4 hours while in her home. She described the feeling as a sense of “choking”. She denied any triggers for her symptoms and reported no exacerbating or alleviating factors. Furthermore, she denied any associated chest pain, syncope, cough, fever, or gastrointestinal symptoms.

The shortness of breath reportedly waxed and waned over the last 4 hours.

She denied any prior history of allergies or atopy. No exposure to new drugs/chemicals or insect bites were reported prior to symptoms onset. She also denied any history of foreign body ingestion.

Her previous medical history was significant only for a diagnosis of schizophrenia, for which she received 3 mg of risperidone once daily and 2 mg of benzotropine once daily.

Upon assessment, the patient was alert and conscious, moving restlessly on the bed. She was able to speak, although not in complete sentences. She was managing her secretions and no cough, stridor, or cyanosis was noted.

On physical examination, her vital signs were: heart rate of 120 beats/minute, blood pressure of 136/85 mmHg, respiratory rate of 24 breaths/minute, oxygen saturation of 97% on room air, oral temperature 36.7°C, and a Glucocheck of 144 mg/dl. No angioedema was noted, and her chest was clear to auscultation with equal breath sounds bilaterally. Her neurological exam revealed normal muscle tone and absence of weakness or sensory deficit in the upper and lower limbs. A brief cerebellar exam revealed a normal gait and absence of dysmetria. Her pupils were equal and reactive, with full extraocular muscles range of motion and no discernible nystagmus. Her cranial nerves exam was grossly unremarkable.

A presumptive diagnosis of panic attack was made, and the patient was kept on a monitored bed due to the tachycardia and mild tachypnea. The emergency team was prepared for invasive airway management should the patient’s condition continue to decline. A diagnosis of anaphylaxis was initially considered but seemed unlikely due to absence of an initial trigger, as well as the clear chest, absence of gastrointestinal symptoms, and no skin or mucous membrane involvement. Furthermore, epiglottitis was considered, but the absence of upper-respiratory tract infection symptoms and the intermittent nature of her symptoms made this diagnosis unlikely.

Approximately 15 minutes after the initial assessment, she developed extension of the neck, upper and lower limbs bilaterally, arching of the back, and transient rolling up of the eyes. A diagnosis of an acute dystonic reaction was made, and 50 mg of intravenous diphenhydramine was given. Prompt improvement of her symptoms followed shortly thereafter, with complete return to her baseline status. Interestingly, a venous blood gas taken shortly after assessment showed a pH of 7.26, CO₂ of 58 mmHg, and HCO₃ of 26 mmol/l.

Reviewing the patient’s file, it was seen that she apparently visited the ED 1 week prior to this presentation, with a similar complaint but of lower intensity. Laboratory testing during that visit revealed only mild leukocytosis, presumably due to acute stress ($17.00 \times 10^9/L$), with a slightly elevated lactic acid (2.43 mmol/l, reference 0.5–2.20 mmol/l). During that visit, she was managed with 1 mg of lorazepam intravenously and then discharged. Interestingly, her venous blood gas (VBG) consistently showed acute respiratory acidosis during each episode.

Upon further enquiry, the patient admitted to being non-complaint with benzotropine. Furthermore, her psychiatrist had increased the risperidone dosage from 2 mg to 3 mg 2 weeks prior to her visit to the ED. The case was discussed with the Psychiatry Service on-call, which recommended keeping the risperidone dose as usual to prevent a relapse of her schizophrenia but with strict compliance to benzotropine. No CNS imaging was required to diagnose the patient’s condition due

Table 1. Summary of the literature review regarding previous cases of acute laryngeal dystonia due to risperidone.

Author	Takhar (1996) [16]	Chakravarty (2005) [18]	Ganesh (2015) [15]	May (2016) [17]
Drug	PO risperidone	PO risperidone, IM haloperidol. Symptoms started soon after haloperidol and were attributed to it	PO risperidone	PO haloperidol, chlorpromazine and risperidone
Patient characteristics	17-year-old male	Elderly male	65-year old male	27-year old male
Diagnosis	Schizophrenia	Pneumonia with acute confusional state	Schizophrenia	Schizophrenia
Presentation	Oral secretions dyspnea	Inspiratory stridor	Stridor, dysphonia	Dysphonia, stridor, retrocollis opisthotonos, focal abduction/extension of the left arm
Interventions	Benztropine 2 mg IM	Treated as anaphylaxis with intravenous hydrocortisone, subcutaneous adrenaline, and intramuscular antihistaminic drugs	25 mg IV diphenhydramine	Benztropine 2 mg IM
Outcome	Started on benztropine 2 mg bid. No recurrence of laryngeal dystonia. Developed delirium secondary to risperidone and was shifted to thioridazine	The stridor continued intermittently for over 48 hours and then disappeared completely	Improved within 60 min; recurred on the following day, but improved with diphenhydramine and clonazepam; discharged on clozapine and clonazepam	24-hour antipsychotic-free period. Later challenged with risperidone 1 mg, with no extrapyramidal symptoms observed

to a normal neurological exam, lack of focality in symptoms, and the temporal relation to antipsychotic usage, in addition to improvement with anticholinergic therapy. Therefore, she was discharged with a diagnosis of acute laryngeal dystonia and the importance of compliance with benztropine was emphasized with the patient.

During the subsequent months, the patient revisited the ED multiple times with the same complaint. Her last visit required emergency airway attention, but all her symptoms ceased with intravenous anticholinergics, averting the need for invasive airway management. She was seen by Psychiatry on-call, which eventually reduced her risperidone dosage to 2 mg and increased benztropine to 2 mg twice daily regularly. Quetiapine was also added for augmentation to prevent relapse of her schizophrenia, with plans to slowly increase the dose while tapering the patient off risperidone.

Discussion

To the best of our knowledge, this article is the first case report of ALD in the Middle East. Other cases reported in the

literature all had variable signs of upper-airway obstruction (e.g., cyanosis, stridor, gasping, and inability to manage secretions). In many cases, a diagnosis of ALD was made retrospectively after the patient's death or after establishing a definitive airway. In fact, ALD has occasionally been initially misdiagnosed as anaphylaxis [10], acute anxiety [11], panic attack [12], and epiglottitis [13].

Most case reports on ALD have been associated with use of typical antipsychotics [14]. Nonetheless, a growing body of evidence suggests a correlation with use of newer atypical agents, particularly risperidone [15]. Although the underlying mechanism responsible for ALD remains unclear, one hypothesis postulates paradoxical adduction of the vocal cords during inspiration, leading to upper-airway obstruction [15]. Unfortunately, this requires performing direct laryngoscopy without a paralyzing agent on all patients with suspected ALD to confirm the diagnosis, which is not feasible in normal clinical practice. Nonetheless, almost all patients diagnosed clinically with ALD who received anticholinergics had significant improvement in their symptoms [15]. This further corroborated acute dystonia as the underlying pathophysiological mechanism.

Four other cases of risperidone related ALD have been reported [15–18]. Unlike 3 of the other cases [15, 17, 18], no stridor was noted in our patient. In 2 cases [16,17], the patients were managed with intramuscular Bzotropine, which resulted in symptom resolution in 10–15 minutes. The third patient was observed for 48 hours as he developed on and off stridor while a surgical airway kit was at bedside [18]. In the aforementioned case, diagnosis was made in retrospect after spontaneous resolution of ALD. Notably, the patient reported by May et al. developed ALD after receiving haloperidol, chlorpromazine, and risperidone during a 3-day period [17]. The patient was later challenged with risperidone, with no recurrence reported. In addition, the patient reported by Chakravarty et al. received haloperidol prior to onset of ALD [18]. Thus, in both of the aforementioned cases, antipsychotic polypharmacy was the most likely cause of symptoms development. In fact, only in 2 other case reports were the symptoms solely attributed to risperidone [15,16]. A summary of risperidone-related ALD is presented in Table 1.

A correlation between antipsychotics usage and sudden death has been reported. In a recent retrospective cohort study, Ray et al. demonstrated that users of both typical and atypical agents had more than double the rate of sudden cardiac death in comparison to nonusers, presumably due to cardiac toxicity [19]. These results have been further corroborated with recent reports showing 15–20 years decreased life expectancy in patients with schizophrenia or bipolar disorder [20,21]. Another possible cause for increased mortality in this group of patients is death by asphyxiation. To date, there have been

2 case reports of ALD-associated deaths [7,8]. Therefore, we strongly recommend that once the diagnosis is made, a clear plan is established to decrease the offending drug dose or change it as soon as possible to prevent recurrent episodes such in the present case.

A review of current and influential emergency medicine textbooks failed to yield any results on ALD [22,23]. As a matter of fact, ALD has been described extensively in the psychiatry literature, but with only 4 previous case reports published in emergency medicine journals [13,24–26]. Laryngeal dystonia, although life-threatening, seems to be underappreciated in the emergency medicine literature.

Conclusions

ALD is a rare, life-threatening, reversible complication of antipsychotics. This diagnosis should be considered in any psychiatric patient presenting with undifferentiated acute-onset shortness of breath, especially if associated with other features of extrapyramidal symptoms or recent increase in antipsychotic dosage. If a high index of suspicion exists, anticholinergics administered parenterally may prevent invasive airway management. Prompt identification is key to management and prevention of these life-threatening episodes.

Conflict of interest

None.

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