CASE REPORT

Evidence-based decision making in an endoscopy nurse with respiratory symptoms exposed to the new ortho-phthalaldehyde (OPA) disinfectant

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Background ortho-Phthalaldehyde (OPA) can cause mucous irritation, respiratory symptoms and IgE-mediated hypersensitivity reactions. Very little information is available about OPA-related effects in health personnel.

Aim To report the decision-making process for the case of an endoscopy nurse complaining of cough and burning of the nose and throat during OPA exposure at work.

Methods The problem focused on the relationship between OPA exposure and the respiratory symptoms and was investigated using an evidence-based (EB) medicine paradigm.

Results A literature search was performed using the database Medline and the search engine Google™. Papers and guidelines were assessed for their suitability in the EB case identification of suspected occupational asthma (OA). A multistep approach suggested by a guideline was considered most appropriate for practical use. The nurse shared the decision-making process and underwent evaluation of the clinical suspicion index and interventions for diagnosis of OA. Despite the high clinical suspicion index, the diagnosis of OA was excluded and any work restriction was avoided. Health surveillance follow-up showed a good clinical outcome and prompt recovery from respiratory symptoms after improvement of environmental control measures.

Conclusion The case study shows that the implementation of EB guidelines provides the occupational physician with an appropriate decision-making process for the identification and management of workers with suspected OA. Screening out of OA is highly relevant because diagnosis of disease requires removal from exposure and frequently impacts negatively on worker employment.

Key words Allergy; Cidex OPA; endoscopy; evidence-based medicine; evidence-based occupational health; fitness for work; health care workers; intervention; occupational asthma; ortho-phthalaldehyde.

Introduction

Cidex ortho-phthalaldehyde (OPA) is a novel high-level disinfectant [1] available as a more effective alternative to the widely used glutaraldehyde (GTA) in the decontamination of endoscopes, as recommended by some institutions [2]. The 0.55% OPA disinfectant solution was marketed as safer than GTA for endoscopy patients [3].

Although OPA is reported as a possible cause of skin irritation and mild respiratory symptoms after prolonged exposure, limited evidence is available about the adverse effects of OPA on endoscopy personnel. In an occupational health survey, neither respiratory symptoms nor skin problems were reported in endoscopy units where OPA was used [4]. Recently, cases of anaphylaxis have been observed in patients undergoing cystoscopy with reports of agent-specific IgE-mediated reactions after repeated close exposure to OPA residues [5].

Case report

A 41-year-old nurse who had worked in an ear, nose and throat day clinic for 3 years complained of work-related persistent cough associated with burning in the nose and throat over the last year. Apart from a single episode of mild wheezing at work, she never complained of asthmatic symptoms, and respiratory examination was
repeatedly negative. She also reported an unusual perioral skin rash during the last 4 months but gave no history of respiratory problems, allergy, family history of atopy or asthma and she was a non-smoker. Her work involved exposure to 0.55% OPA solution during endoscope disinfection by immersion in an open plastic tray in a small room with poor ventilation. The personal exposure to OPA was estimated at 5–10 min per endoscope and 10 endoscopes per day for 3 days a week.

Formulating the question
An evidence-based (EB) investigation aimed at decision making for the correct identification, evaluation and workplace management of a worker with suspected occupational asthma (OA) was carried out. Using the PICO (Patient/Population, Intervention, Comparison/Control/Exposure, Outcome) model in occupational health [6], the problem was focused on the need (i) to establish a relationship between the exposure to OPA and the respiratory symptoms (diagnostic problem) and (ii) to undertake an appropriate intervention (management problem). Accordingly, the clinical problem was summarized as follows: in a 41-year-old nurse, exposed to OPA in an endoscopy unit, can the respiratory symptoms be evaluated as OA and will the condition require removal from the exposure?

Searching for evidence
To achieve information on sensitization to and respiratory effects of OPA, a first search on Medline was carried out using the text word ‘ortho-phthalaldehyde’, leading to 599 results with only two relevant documents, the remainder being related to microbiology techniques and hygiene procedures. Search using ‘Cidex OPA’ obtained the same two documents out of 10 results. Combining these searches with ‘asthma,’ ‘respiratory disorders’ or ‘health effects’ produced no results, while only one document was found using ‘Cidex OPA’ and ‘allergy’.

Because this information did not provide an explicit answer, a search on Medline was made using the text word ‘occupational asthma guidelines’. The search yielded 82 guidelines, one of which was considered appropriate [7]. The same text word was used in the search engine Google™, and two other relevant documents [8,9] were found.

Appraising the evidence
The three guideline documents identified were assessed for how recent they were and their usefulness in the evaluation of a suspected case of OA. The British Occupational Health Research Foundation guidelines [9] were the most recent and targeted to professional practice, and were felt to be the most suitable for clinical use in a multistep case identification approach.

Applying the evidence
Using the guidelines document, a high clinical suspicion index for OA was estimated (Table 1). The nurse shared the decision to follow this multistep ‘case identification’ approach and was properly informed about (i) the diagnostic procedure for OA, (ii) the possibility of work restrictions, (iii) the need for appropriate therapy and (iv) the legal, ethical and financial consequences. Therefore, a decision-making multistep process was undertaken (Table 2).

Clinical evaluation of the nurse’s airways did not reveal any pathological findings. Respiratory function tests were normal and non-specific bronchial challenge while at work showed moderate hyperreactivity (methacholine PD20 FEV1 = 769 µg) that did not significantly improve after 2 weeks away from work. Skin prick test

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Nurse</th>
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<tbody>
<tr>
<td>Aldehydes are documented as common causative agents of OA</td>
<td>+</td>
</tr>
<tr>
<td>Health care workers are considered among the highest prevalence working groups affected with OA</td>
<td>+</td>
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<tr>
<td>Risk of sensitization and OA is increased by higher exposure to causative agents</td>
<td>+</td>
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<tr>
<td>Atopy increases the risk of IgE-mediated OA</td>
<td>− a</td>
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<tr>
<td>Smoking can increase the chance of OA caused by a few sensitizing agents</td>
<td>−</td>
</tr>
<tr>
<td>Occupational rhinitis can frequently appear in comorbidity with asthma symptoms, and is more likely before the onset of IgE-mediated OA</td>
<td>+</td>
</tr>
<tr>
<td>The chance of developing OA symptoms is highest in the year after the onset of occupational rhinitis</td>
<td>+</td>
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<tr>
<td>Latency time between beginning of exposure to the causative agents and onset of respiratory symptoms has often been estimated in years</td>
<td>+</td>
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<tr>
<td>Not wearing respiratory protective equipment during exposure to causative agents is associated with higher risk of OA</td>
<td>+</td>
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<tr>
<td>Satisfaction of screening criteria (atopy, smoking, genetic susceptibility and allergen sensitization) during pre-placement examinations has very low positive predictive value to screen out job applicants</td>
<td>−</td>
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<tr>
<td>Previous history of asthma is not significantly associated with OA</td>
<td>−</td>
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</table>

Presence (+) or absence (−) of the specific risk factor.

*OPA is a low-molecular-weight agent.
for environmental allergens and latex proteins was negative. OPA-specific serum IgE level was not available. Peak expiratory flow (PEF) monitoring by use of a disposable Mini-Wright was self-managed after proper training for 1 month (2 weeks at work, 2 weeks away from work) taking six daily measurements and choosing the best among three tests for each measurement, according to Bernstein [10]. Serial PEF records were independently assessed by two experts and scores compared for interpretation agreement (98%). On the basis of a mean daily variability of 7.5% at work and 8.3% away from work, no significant PEF deterioration between periods at work and off work and between work shifts with and without OPA exposure was observed.

**Evaluating the process**

The nurse did not show any work-related changes on serial PEF monitoring and non-specific bronchial reactivity at or away from work, despite the high suspicion index for OA. On the basis of the multistep decision-making process (Table 2), the diagnosis of work-related asthma was excluded [11], the worker’s symptoms were characterized as an irritant airway syndrome not aggravated at work [7] and work restrictions were avoided.

Screening out of OA is a very important issue because the diagnosis of the specific disorder requires prompt removal from exposure and possibly job loss [12]. Follow-up health surveillance did not show any worsening of respiratory symptoms or changes of airway hyperreactivity. After improvement of the working environment, the nurse’s symptoms at work disappeared, suggesting an irritant condition [7].

In conclusion, asthma, the most common lung disorder in the workplace, can be caused by occupational exposure to aldehydes [13,14]. The need for correct identification of work-related asthma in workers with a high clinical suspicion index is emphasized here. Since ~30% of OA workers are at high risk of long-term unemployment [12], the negative impact on worker employment (ethical cost, financial loss) associated with the diagnosis of OA must be carefully evaluated. The case study shows that, in spite of the absence of agreed diagnostic criteria and although specific bronchial challenge is considered the gold standard, the use of EB guidelines provides the occupational physician with an appropriate tool for the identification and management of workers suspected of having OA. The EB decision-making process in this case resulted in a good clinical outcome and specific bronchial challenge test was not crucial in solving the problem.

**Conflicts of interest**

None declared.

**References**


