Research letters

reimbursement of such medicine to COPD patients introduced in Norway in 2006. Most recently, combined ICS/LABA inhalers are once again reimbursed for COPD in Norway, but only when the $FEV_1 \%$ predicted is < 60%.

Conflicts of interest

None.

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GPs' role in reducing the risk of bronchospasm in asthma patients undergoing general anaesthesia and/or intravascular administration of radiographic contrast media

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Dear Sirs,

Asthma is recognised as a highly prevalent health problem in the developed and developing world. Its inadequate control is the main reason for the increased risk of bronchospasm in children or adults undergoing surgical intervention under general anaesthesia (surgery

➔ GA) or intravascular administration of radiographic contrast media (RCM) for diagnostic purposes.^{1,2} Severe perioperative bronchospasm has been reported in 0.17–4.2% of all GA procedures carried out in patients with asthma,³ and severe bronchospasm has been reported in 0.18–4% of procedures using RCM. Bronchospasm in asthma patients may lead to several peri- and/or post-operative and RCMrelated complications (see Table 1). However, the international GINA Guidelines⁴ contain only a few sentences on the risk of surgery + GA for asthma patients, and there is no mention of the risk of intravascular RCM administration.

Although there is little if any literature on the relationship between the degree of asthma control and the risk of intraoperative/intra-RCM infusion bronchospasm, good clinical practice suggests that optimal control of asthma symptoms in 'real life' is an important prerequisite for safer surgery (either elective or

Table 1. Possible consequences of bronchospasm in asthma	a patients undergoing GA and / or administration of RCM
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Surgery with GA		Use of RCM
 Perioperative Hypoxemia Increase of airway resistance / alveolar hypoventilation Prolonged intubation Biotrauma from pulmonary extention 	 Postoperative Mucus plugging and segmental atelectasis Wheezing Pneumonia Aspiration of biologic materials (*) Prolonged mechanical ventilation (*) Irreversible brain damage / exitus (**) 	 Hypoexmia Increase of airway resistance Necessity of discontinuing the procedure Alteration of RCM diffusion from vascular / ventilatory alteration induced by hypoxemia related vasoconstriction.
(*) In older patients; (**) In the case of severe bronchospasm; GA = General anaesthesia; RCM = Radio contrast media		

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333

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Research letters



emergency) requiring GA and/or RCM administration. The few available data emphasise the role of optimal clinical, functional, and therapeutic management in order to obtain best possible control of airway inflammation and clinical symptoms prior to these procedures.^{1,5,6}

Different doctors (the general practitioner (GP) as well as other specialists) are involved in asthma care and asthma control (see Figure 1). The management of bronchospasm occurring during surgery + GA as well as during RCM administration is usually carried out by anaesthesiologists and radiologists. In emergency situations, patients with uncontrolled asthma display the highest risk of bronchospasm because no assessment of asthma control can be performed prior to the procedure and sometimes only short-term premedication can be administered.7 In "high speciality" hospitals, if surgery + GA and/or RCM use is planned, a preliminary assessment of asthma patients can be performed by pulmonologists or by respiratory-trained physicians, and if necessary adequate therapy initiated to reduce the risk of obstructive airway complications.8 The problem arises for those asthma patients undergoing surgery + GA in hospitals without pulmonologists, or when procedures requiring administration of intravascular RCM must be carried out in outpatient departments; in this latter situation, there is usually no preventative specialist opinion available.

It is widely acknowledged that disease control is inadequate in a large number of asthma patients for a number of reasons, although 'disease control' is the most important goal for all physicians involved in asthma care (see Figure 1). We believe that the problem faced by asthma patients when they are about to undergo planned surgery + GA or intravascular administration of RCM should be considered in the context of their overall 'real life' management – and that consequently the role of the GP is of paramount importance. Therefore, we believe that it is the responsibility of the GP to check beforehand that the degree of asthma control prior to these procedures is optimal. If the GP knows that his or her asthma patient is about to undergo surgery + GA or intravascular RCM administration, they should check the patient's asthma control by administering an asthma questionnaire or by performing office

spirometry (if equipped). In the case of poor disease control, treatment should be modified and the patient reviewed again. The GP might also require a specialist or secondary care consultation for the patient prior to surgery + GA or RCM administration. Thus, optimally controlled asthma patients will be able to have their procedures performed without additional pre-treatment if the pre-operative respiratory assessment (carried out in hospital) confirms good disease control.

In addition, the GP should also evaluate other risk factors related to concomitant allergic diseases such as drug and latex allergy. In these patients it could be useful to administer antihistamines to prevent or at least reduce the magnitude of potential systemic reactions.⁹

GPs should be aware of their central role in managing asthma patients in 'real life'. This entails increasing efforts to obtain optimal asthma control by using an adequate therapeutic regimen, effective measures to reduce exposure to disease triggers, educational support, specialist referrals, and the use of validated questionnaires such as the Asthma Control Questionnaire (ACQ) or the Asthma Control Test (ACT) – which can be administered by telephone.¹⁰

Prospective large studies should be planned to study the risk of bronchospasm for asthma patients undergoing surgery + GA or RCM administration, and the cost/benefit ratio of obtaining optimal disease control prior to the procedure, including prescribing of appropriate therapy and preliminary checks by GPs of patients' asthma control status. This would likely lead to improved GINA Guideline implementation and a reduction in the risk of bronchospasm in asthma patients undergoing surgery + GA or RCM administration.

Conflicts of interest

All authors declare no conflict of interest in relation to this article.

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Research letters

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335

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