



## Unexpected anterograde amnesia associated with Buscopan used as a premedication for endoscopy

Hyuk Lee, Hee Jung Son, Poong-Lyul Rhee, Jae J Kim, Jong Chul Rhee

Hyuk Lee, Hee Jung Son, Poong-Lyul Rhee, Jae J Kim, Jong Chul Rhee, Departments of Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul 135-710, Korea

Hee Jung Son, Center for Health Promotion, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul 135-710, Korea

Correspondence to: Hee Jung Son, MD, Department of Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Irwon-dong 50, Gangnam-gu, Seoul 135-710, Korea. hjsong@smc.samsung.co.kr

Telephone: +82-2-34103409 Fax: +82-2-34103849

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remains controversial, premedication is widely administered in clinical practice<sup>[1]</sup>. Adverse events of antispasmodic agents are generally associated with their peripheral antimuscarinic action<sup>[2]</sup>. However, the symptoms and signs associated with an absolute or relative reduction in cholinergic activity of the central nervous system seems to be underestimated. We present here three cases of anterograde amnesia associated with hyoscine butylbromide (Buscopan; Boehringer Ingelheim, Germany) used as a premedication for endoscopy at our endoscopy unit.

### CASE REPORT

Three patients who presented for medical examination without any signs or symptoms underwent upper gastrointestinal endoscopy with premedication using hyoscine butylbromide. No sedative agents, such as benzodiazepine or propofol, were used. The patients received intramuscular injection of Buscopan (20 mg) ten minutes prior to the endoscopic procedure. The procedure time was 5 to 10 min. The patients were middle-aged women, and had neither a remarkable past medical history nor a history of drug medication. None of the patients had any sign of an organic neurological disease.

The first patient was a 58-year-old woman. Her body weight and height were 58.0 kilograms and 63.8 inches (body mass index: 22.1 kg/m<sup>2</sup>). The results of upper gastrointestinal endoscopy revealed atrophic mucosal changes at the gastric antrum and a duodenal ulcer scar. Immediately after withdrawal of the endoscope, the patient appeared to be confused asking about when the examination would begin, showing memorial blackout throughout. The laboratory findings and the medical examination were within normal limits.

The second case was a 50-year-old woman. Her body weight and height were 53.5 kilograms and 65.0 inches (body mass index: 19.7 kg/m<sup>2</sup>). The results of upper gastrointestinal endoscopy revealed only chronic superficial gastritis. Physical examination noted a thyroid nodule. However, the thyroid function was within normal limits. As in the first case presented here, she was alert immediately after the procedure.

The last case was a 56-year-old woman suffering from transient global amnesia. Her body weight and height were 50.0 kilograms and 61.8 inches (body mass index: 20.3 kg/m<sup>2</sup>). The results of upper gastrointestinal endoscopy showed a small polyp at the gastric antrum. This case

### Abstract

It has been known that peripheral adverse event is caused by peripheral antimuscarinic action, from hyoscine butylbromide (Buscopan; Boehringer Ingelheim, Germany) used as a premedication for endoscopy. However, symptoms or signs associated with the central nervous system are rarely reported in the field of anesthesiology and peripartum labor. This central anticholinergic syndrome is likely caused by blockade of muscarinic cholinergic receptors in the central nervous system. There is no report on Buscopan-induced central anticholinergic syndrome in endoscopy room so far. Three middle-aged females unexpectedly suffered from anterograde amnesia after intramuscular injection of hyoscine butylbromide as an antispasmodic premedication for endoscopy at our endoscopy unit in the Health Promotion Center.

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**Key words:** Endoscopy; Hyoscine butylbromide; Central anticholinergic syndrome; Amnesia

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### INTRODUCTION

Although the role of antispasmodic agents in endoscopy

was different from the other two cases in that she had a recovery phase of memory. That is, on examination, we noted that she regained memory 20 min after the procedure. There were no remarkable clinical findings except for a thyroid cyst with normal thyroid function. The vital signs such as blood pressure, heart rate and body temperature were normal in all patients during amnesia.

## DISCUSSION

Hyoscine is an alkaloid with an anticholinergic effect that inhibits the muscarinic actions of acetylcholine at postganglionic parasympathetic neuroeffector sites and the sites commonly affected are smooth muscle, secretory glands and the central nervous system. Small doses effectively inhibit salivary and bronchial secretions as well as sweating. This drug is available as hydrobromide and butylbromide salts. The onset of action of intramuscular hyoscine is from three to five minutes and the duration of spasmolytic and antisecretory action is fifteen minutes and several hours, respectively. Unlike hydrobromide, hyoscine butylbromide does not cross the blood-brain barrier and is rarely associated with central symptoms<sup>[2,3]</sup>.

Although intramuscular hyoscine butylbromide is considered a safe drug, it is not without side effects. The cases we report here suggest that anterograde amnesia is associated with central anticholinergic syndrome which is likely caused by blockade of muscarinic cholinergic receptors in the central nervous system, and is associated with central nervous system signs, such as somnolence, confusion, amnesia, agitation, hallucination and coma<sup>[4]</sup>. Only a few case reports have shown hyoscine-induced central anticholinergic syndrome in peripartum labor and postoperative setting. Because central anticholinergic syndrome can be diagnosed and treated with a cholinesterase inhibitor, its diagnosis is almost always presumptive<sup>[5]</sup>. In spite of resolution without treatment, we could presume this diagnosis in that the amnesic

period was associated with the duration of drug action. Physostigmine is a well-known effective therapeutic agent for anticholinergic toxicity and enhances acetylcholine activity by inhibiting acetylcholinesterase. In addition, it crosses the blood-brain barrier, reversing symptoms of the central anticholinergic syndrome, as well as peripheral toxic anticholinergic manifestations<sup>[6]</sup>. Although no dangerous central signs in our cases made it unnecessary to administer a cholinergic drug, this treatment can be considered for hyoscine-induced central anticholinergic syndrome associated with endoscopy.

In summary, we report case series of anterograde amnesia associated with central anticholinergic syndrome caused by hyoscine butylbromide used as a premedication for endoscopy. Treatment with cholinergic agent can be considered for patients who have unexpected amnesia and have not had a sedative premedication.

## REFERENCES

- 1 Mui LM, Ng EK, Chan KC, Ng CS, Yeung AC, Chan SK, Wong SK, Chung SC. Randomized, double-blinded, placebo-controlled trial of intravenously administered hyoscine N-butyl bromide in patients undergoing colonoscopy with patient-controlled sedation. *Gastrointest Endosc* 2004; **59**: 22-27
- 2 Renner UD, Oertel R, Kirch W. Pharmacokinetics and pharmacodynamics in clinical use of scopolamine. *Ther Drug Monit* 2005; **27**: 655-665
- 3 Ali-Melkkilä T, Kanto J, Iisalo E. Pharmacokinetics and related pharmacodynamics of anticholinergic drugs. *Acta Anaesthesiol Scand* 1993; **37**: 633-642
- 4 Miranda MI, Ferreira G, Ramírez-Lugo L, Bermúdez-Rattoni F. Role of cholinergic system on the construction of memories: taste memory encoding. *Neurobiol Learn Mem* 2003; **80**: 211-222
- 5 Wilden J, Rapeport D. Presumed central anticholinergic syndrome from inadvertent intravenous hyoscine hydrobromide (scopolamine) injection. *Anaesth Intensive Care* 2004; **32**: 419-422
- 6 Martin B, Howell PR. Physostigmine: going ... going ... gone? Two cases of central anticholinergic syndrome following anaesthesia and its treatment with physostigmine. *Eur J Anaesthesiol* 1997; **14**: 467-470

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