CASE REPORT

Anaesthesia management for acute appendicitis in cases with Sjögren's syndrome accompanying autoimmune hepatitis

Ismail Demirel, Ayse Belin Ozer, Mustafa K Bayar, Omer L Erhan

Department of Anesthesiology and Reanimation, Firat University, Elazig, Turkey

Correspondence to
Dr Ayse Belin Ozer,
abelinozer@gmail.com

SUMMARY

Characterised by lymphocytic infiltration of exocrine glands, Sjögren's syndrome (SS) is a chronic autoimmune disease. Symptoms belonging to the involved systems may occur owing to the fact that it affects multiple systems. While rheumatoid arthritis is observed concomitantly, its co-occurrence with autoimmune hepatitis is astonishingly common. Through this case report, we intended to review issues that should be attended to while administering anaesthesia to a patient with SS accompanying autoimmune hepatitis. In the light of literature, we aimed to discuss anaesthesia management to the patient with SS and issues stemming from the clinical features of SS. In SS, the expected issues are liver problems related autoimmune hepatitis and respiratory problems related pulmonary fibrosis.

A careful preoperative evaluation, a comprehensive preparation against difficulty in intubation, a selective anaesthesia management in terms of autoimmune hepatitis and close monitoring of postoperative respiration may prevent or decrease possible complications.

BACKGROUND

Sjögren's syndrome is a chronic autoimmune disease with slow course causing dryness in eyes and mucosa due to disorder of secretion functions as a result of lymphocytic infiltration of exocrine glands. Although, in this syndrome, autoimmune exocrinopathy exists, extraglandular (systemic) tissue and organ (lung, liver, kidney, vein, etc) involvement may occur in one-third of the cases. The disease was named after Sjögren, Swedish ophthalmologist, following his definition of the disease in 1933. Sjögren's syndrome is not a rare disease. However, since epidemiological studies are conducted in the light of various criteria, its prevalence among population is not known exactly. It is believed that its prevalence is between 0.6% and 3% with an incidence of 390/100 000. While it appears more in the fourth and fifth decades, it is observed nine times higher in women compared with men.¹

Sjögren's syndrome has two types: primary Sjögren's syndrome contains systemic involvement as well in addition to dryness in eyes and mouth that are characteristic findings. In secondary Sjögren's syndrome, primary Sjögren's syndrome and other systemic autoimmune diseases coexist.²

The involvement of non-exocrine organs including lungs, liver, kidneys and central nervous system were reported for primary Sjögren's syndrome. The relation between liver disease and primary Sjögren's syndrome was first defined in 1954 by Christiansson.³ The said relation is strikingly common when compared to the relation between other autoimmune diseases such as rheumatoid arthritis and liver disease.⁴ This relation was understood more clearly following the presentation of biochemical, serological and histological findings in combination with case series.^{5–7} In addition, it is known that primary Sjögren's syndrome is more prevalent among patients with primary biliary cirrhosis.^{8–9} In their broad series of 300 patients, Skopouli *et al*¹⁰ reported that almost all patients with primary biliary cirrhosis with primary Sjögren's syndrome had liver disease although primary Sjögren's syndrome rarely affects liver. On the other hand, it is known that abnormal liver biochemical profiles are present more often in patients with primary Sjögren's syndrome with kidney, lung or haematological anomalies.^{11–13}

Along with the literature, we aimed to discuss by presenting both the issues stemming from the clinical features of our 40-year-old female patient whose SS and autoimmune hepatitis diagnoses were made 10 months ago and acute appendectomy operation under anaesthesia was planned and our anaesthesia approach.

CASE PRESENTATION

Our 40-year-old patient weighing 75 kg who presented to the emergency room with complaints of stomach ache, nausea and vomiting was admitted to the general surgery clinic with a prediagnosis of acute appendicitis. Preoperative evaluation conducted for urgent appendectomy revealed that dryness in mouth and eyes and non-specific gastrointestinal complaints were present; the patient was diagnosed with Sjögren's syndrome and autoimmune hepatitis 10 months ago and had been suffering from ischaemic heart disease for 2 years. On abdominal examination, defence and rebound were detected in the patient who was on budenofalk, ursofalk and azathioprine. Other system examinations were assessed to be normal. Cardiology consultation was requested for ischaemic heart disease. Negative T waves were present in V1–5 in ECG. Preoperative laboratory evaluation of the patient revealed haemoglobin (Hgb): 11.2 g/dl, haematocrit (Htc): 34.4%, platelet: 2 68 000 and

To cite: Demirel I, Ozer AB, Bayar MK, *et al*. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-008111

international normalised ratio: 1.01, and other blood and biochemical values were within normal limits. Mallampati classification score was established to be 2.

A pathological appearance was not present in the posteroanterior chest x-ray. Until preoperative fasting period is over, the patient was administered 100 ml/h 0.9% NaCl infusion through peripheral vascular access. Premedication was not administered. Taken to the operation room, the patient was conducted non-invasive arterial blood pressure measurement, ECG and peripheral oxygen saturation monitoring. Preinduction haemodynamic values were recorded as heart rate (HR): 74/min, blood pressure (BP): 122/78 mm Hg and peripheral oxygen saturation (SpO₂): 96. Train-of-four (TOF) (TOF-Watch SX Monitor Software Organon Ltd, Dublin, Ireland) was used for neuromuscular conduction and muscle relaxation monitoring. To this end, electrodes were placed on the ulnar nerve tract. After meeting the requirements for difficult intubation, preoxygenation was administered for 5 min. Following muscle relaxation during induction by propofol 2.5 mg/kg intravenous and cisatracurium 0.1 mg/kg, orotracheal intubation was conducted by laryngoscopy (grade 2 direct laryngoscopy image) at the first try after obtaining a complete muscle relaxation upon TOF measurement. Postintubation inhalation was provided by 6% desflurane and 50% O₂–50% air at 4 L/min gas stream. After 1 µg/kg loading dose, Remifentanyl was administered as 0.5 µg/kg/min infusion for analgesics. Saline was occasionally administered to the eyes to prevent dryness. Blood gas sample of the patient taken preoperatively revealed pH: 7.379, PaCO₂: 35.6 mm Hg, pO₂: 156 mm Hg HCO₃: 21.5 mmol/l BE: –3.7, Na: 137 mmol/l, K: 3.5 mmol/l. HR, BP and SpO₂ values throughout the operation (45 min) are given in table 1. In all, 50 mg dextketoprofen and 10 mg metoclopramide HCl were intravenously administered 15 min before the end of the operation.

At the end of the operation, inhalation agents were discontinued and the patient was ventilated with 100% oxygen while skin suturing was being carried out. No antagonist agents were administered. When neuromuscular function was believed to have been completely regained (holding head for 5 s, hand grip for 5 s, following simple orders, SpO₂ 95% and above in spontaneous breathing) for spontaneous breathing and upper airway protection, extubation was carried out and the patient was then taken to postanaesthesia care unit. Repeating haemodynamic measurements of the patient that read HR: 77/min, BP:

118/75 mm Hg and SpO₂: 99% at the postanaesthesia care unit are given in table 2. Revived and in stable condition, the patient was sent to the general surgery clinic due to a TOF rate of above >0.9 at postoperative 30 min. On the postoperative third day, the patient whose liver function values were normal was discharged following the recommendations.

DISCUSSION

Sjögren's syndrome is a chronic autoimmune disease more common among women and frequently observed in the fourth decade.¹⁴ It is characterised by progressive lymphocytic infiltration of exocrine glands and epithelial tissue and it primarily involves lacrimal and salivary glands.¹⁵ Two typical characteristics of the disease are keratoconjunctivitis sicca (dry eye) and xerostomia (dry mouth).^{14–17}

This syndrome may involve nervous, musculoskeletal, circulation, gastrointestinal and haematological systems. Motor or sensory neuropathy, aseptic meningitis and dementia may develop. It may reveal symptoms related to respiratory and renal functions by affecting these systems.^{16 19 20} Anaemia and leukopenia may be observed. Non-steroidal anti-inflammatory drugs such as salicylate, indomethacin, ibuprofen are used for treatment in such cases as arthralgia, myalgia, adenoids, and sialadenitis, hydroxychloroquine.

Our 40-year-old female patient who had non-specific gastrointestinal complaints was diagnosed with SS and autoimmune hepatitis 10 months ago. Clinically, dryness in eyes and mouth was also present in addition to gastrointestinal complaints. Budenofalk, ursofalk and azathioprine were used for the treatment.

Sjögren's syndrome has two clinical types—primary and secondary. While in the primary Sjögren's syndrome only lymphocytic infiltration of exocrine glands and epithelial tissue and their clinical symptoms are observed, other autoimmune diseases are present in the secondary Sjögren's syndrome in addition to clinical symptoms. While it is commonly accompanied by rheumatoid arthritis, it is not quite rare to observe the disease along with autoimmune hepatitis.^{16 17} Restriction in cervical motion and temporomandibular joints was not present in our case that had secondary Sjögren's syndrome. Nevertheless, fiberoptic laryngoscopy and emergency tracheostomy conditions were prepared in the preoperative period bearing in mind the difficult intubation possibility. Preoxygenation was administered before anaesthesia induction. Then, propofol was administered during the induction and orotracheal intubation was conducted at the first try by administering cisatracurium for tracheal intubation after observing the patient being easily ventilated.

The development of dehydration should be avoided in addition to the use of antihistamines, ephedrine, epinephrine,

Table 1 Preoperative haemodynamic values of the patient

	Heart rate (min)	Arterial blood pressure (mm Hg)	SpO ₂ (%)
Preinduction	74	122/78	96
During induction	81	118/71	99
During intubation	88	132/81	99
1 min	84	105/73	100
5 min	80	100/64	100
10 min	70	120/80	100
15 min	71	132/93	100
20 min	66	113/74	100
25 min	64	104/68	100
30 min	67	107/70	100
35 min	60	106/68	100
40 min	68	122/75	100
Extubation	95	146/91	99

Table 2 Postoperative haemodynamic changes of patient

	Heart rate (min)	Arterial blood pressure (mm Hg)	SpO ₂ (%)
1 min	81	161/94	94
5 min	90	125/74	97
10 min	77	118/75	99
15 min	77	117/74	98
20 min	67	114/73	97
25 min	71	117/76	99
30 min	69	114/72	98

amphetamine, phenothiazine, propantheline, sedative hypnotic and Parkinson's disease medication in Sjögren's syndrome.¹⁴

Takahashi *et al*²⁰ reported in anaesthesia administration of a patient with Sjögren's syndrome with pulmonary fibrosis that they avoided atropine and all agents causing dry mouth and administered saline drops to eyes in 10-min intervals in order to prevent dryness in eyes. We provided the patient with intravenous fluids during the period in which we prevented oral food intake in order to not cause dehydration in our patient. In the preoperative period, we avoided atropine premedication and the use of other agents reported to be damaging and also anticholinesterase medication in order to not administer anticholinergic during extubation. In the postoperative period, we provided a frequent evaluation of the neuromuscular agent by using TOF monitoring. We administered saline to eyes in certain intervals for the symptomatic treatment of dry eyes.

Hypokalaemia may be observed at a rate of 25–40% due to renal tubular acidosis in patients with Sjögren's syndrome.²¹ Ohtani *et al*¹⁸ reported that hypokalaemia-related respiratory arrest was developed in a female patient with SS. We, too, checked serum electrolytes through preoperative blood gas examination on our patient whose serum electrolytes proved to be normal in preoperative tests. We believe that changes in fluids and electrolytes of such patients should be carefully monitored.

Urban *et al*¹⁹ reported that sensory neuropathies may occur due to trigeminal, glossopharyngeal and vagal nerves' involvement in patients with Sjögren's syndrome, and related symptoms may frequently be observed. Therefore, we extubated the patient after waiting for consciousness, motor strength and protective reflexes regaining in a sufficient level.

Autoimmune hepatitis prevalence especially in patients with pSS was reported to be between 4% and 47%.^{12–22} In their studies, Lindgren *et al*¹² and Montañío-Lozo *et al*¹³ established the autoimmune hepatitis prevalence of patients with pSS to be 4% and 2%, respectively. In another study, autoimmune hepatitis prevalence in patients with pSS was found to be 1%, but it was reported that a clear information was not present as to the autoimmune hepatitis prevalence in patients with secondary Sjögren's syndrome.²³

Optimal anaesthetic method for patients with liver disease still continues to be an issue. It was reported that modern volatile anaesthetic agents are the best choice in patients with liver diseases and cisatracurium as neuromuscular agent and fentanyl, sufentanil or remifentanyl as opioids can be used.²⁴ Animal studies suggested that volatile anaesthetics and remifentanyl protect the liver better.^{25–26} In human studies, desflurane was established to have fewer side effects on liver and kidney functions compared to sevoflurane.²⁷ Postoperative liver function tests were found to be similar in patients who were medicated with sevoflurane and propofol after hepatectomy.²⁸ Today, debates over the choice of liver-protecting anaesthetic agents for liver patients has not yet been clarified. We believe that we preserved the liver by administering propofol and cisatracurium during the induction of anaesthesia and desflurane and remifentanyl during maintenance.

In Sjögren's syndrome that has multisystemic effects, systemic organ involvements, sensory neuropathies, fluid-electrolyte balance disorders, immunodepression, autoimmune hepatitis-related liver function disorder, possibility of aspiration and late recovery are frequently observed conditions. Since literature review did not produce any results as to how anaesthesia approach should be for patient with secondary Sjögren's syndrome with autoimmune hepatitis, it is necessary to establish

the current issues in anaesthesia of such patients by careful pre-operative evaluation, to avoid the use of such agents as atropine and sedative hypnotics during premedication, to use occasional saline in order to prevent preoperative dry eye, to correct of electrolyte imbalance and to opt for liver-protecting anaesthesia method.

Learning points

- ▶ Sjögren's syndrome is a chronic autoimmune disease which may involve nervous, musculoskeletal, circulation, gastrointestinal, and hematologic systems.
- ▶ In addition to multi-systemic effects, fluid-electrolyte balance disorders, immunodepression, autoimmune hepatitis-related liver function disorder, possibility of aspiration, and late recovery are frequently observed conditions.
- ▶ During anaesthesia management they were done something: careful preoperative evaluation, to avoid the use of such agents as atropine and sedative hypnotics during premedication, to use occasional saline in order to prevent preoperative dry eye, to correct of electrolyte imbalance, and to opt for liver-protecting anaesthesia method.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Lahita RAG. Sjögren syndrome. In: Lahita RG, Chiorazzi N, Reeves WH, eds. *Textbook of the autoimmune disease*. Philadelphia: Lippincott Williams Wilkins, 2000:569–72.
- 2 Naguwa S, Gershwin ME. Sjögren syndrome. In: Goldman L, Ausiello D, eds. *Cecil textbook of medicine*. Philadelphia: Saunders, 2004:1677–80.
- 3 Cristanssón J. Corneal changes in a case of hepatitis. *Acta Ophthalmol (Copenh.)* 1954;32:161–4.
- 4 Whaley K, Goudie RB, Williamson J, *et al*. Liver disease in Sjögren's syndrome and rheumatoid arthritis. *Lancet* 1970;1:861–3.
- 5 Lopes JD, Acras S, Borini P, *et al*. Hepatic involvement in Sjögren's syndrome. *Acta Gastroenterol Latinoam* 1974;6:1–5.
- 6 Vogel C, Wittenborg A, Reichart P. The involvement of the liver in Sjögren's syndrome. *Oral Surg Oral Med Oral Pathol* 1980;50:26–9.
- 7 Webb J, Whaley K, MacSween RN, *et al*. Liver disease in rheumatoid arthritis and Sjögren's syndrome. Prospective study using biochemical and serological markers of hepatic dysfunction. *Ann Rheum Dis* 1975;34:70–81.
- 8 Alarcón-Segovia D, Díaz-Jouanen E, Fishbein E. Features of Sjögren's syndrome in primary biliary cirrhosis. *Ann Intern Med* 1973;79:31–6.
- 9 Tsianos EV, Hoofnagle JH, Fox PC, *et al*. Sjögren's syndrome in patients with primary biliary cirrhosis. *Hepatology* 1990;11:730–4.
- 10 Skopouli FN, Barbatis C, Moutsopoulos HM. Liver involvement in primary Sjögren's syndrome. *Br J Rheumatol* 1994;33:745–8.
- 11 Kaplan MJ, Ike RW. The liver is a common non-exocrine target in primary Sjögren's syndrome: a retrospective review. *BMC Gastroenterol* 2002;2:21.
- 12 Lindgren S, Manthorpe R, Eriksson S. Autoimmune liver disease in patients with primary Sjögren's syndrome. *J Hepatol* 1994;20:354–8.
- 13 Montañío-Loza AJ, Crispin-Acuna JC, Remes-Troche JM, *et al*. Abnormal hepatic biochemistries and clinical liver disease in patients with primary Sjögren's syndrome. *Ann Hepatol* 2007;6:150–5.
- 14 Fox RI. Sjögren's syndrome. *Lancet* 2005;366:321–31.
- 15 Neville BW, Damm DD, Allen CM, *et al*. Salivary gland pathology. In: *Oral and maxillofacial pathology*. 2nd edn. Philadelphia: WB Saunders, 2002:401–4.
- 16 Nikitakis NG. Primary Sjögren syndrome in childhood: report of a case and review of the literature. *Oral Sur Oral Med Oral Pathol* 2003;96:42–7.
- 17 Vitali C, Bombardieri S. Classification criteria for Sjögren's syndrome: a revised version of the European criteria proposed by the American-European Consensus Group. *Ann Rheum Dis* 2002;61:554–8.

- 18 Ohtani H. Severe hypokalaemia and respiratory arrest due to renal tubular acidosis in a patient with Sjögren syndrome. *Nephrol Dial Transplant* 1999;14:2201–3.
- 19 Urban PP. Sensory neuropathy of the trigeminal, glosso-pharyngeal, and vagal nerves in Sjögren's syndrome. *J Neurol Sci* 2000;186:59–63.
- 20 Takahashi S. Anesthetic management of a patient with Sjögren's syndrome and pulmonary fibrosis. *Masui* 1990;39:1393–6.
- 21 Siamopoulos KC. Kidney involvement in primary Sjögren's syndrome. *Scand J Rheumatol* 1986;61:156–60.
- 22 Matsumoto T, Morizane T, Aoki Y, *et al.* Autoimmune hepatitis in primary Sjögren's syndrome: pathological study of the livers and labial salivary glands in 17 patients with primary Sjögren's syndrome. *Pathol Int* 2005;55:70–6.
- 23 Karp JK, Akpek EK, Anders RA. Autoimmune hepatitis in patients with primary Sjögren's syndrome: a series of two-hundred and two patients. *Int J Clin Exp Pathol* 2010;3:582–6.
- 24 Hoetzel A, Ryan H, Schmidt R. Anesthetic considerations for the patient with liver disease. *Curr Opin Anaesthesiol* 2012;25:340–7.
- 25 Schmidt R, Tritschler E, Hoetzel A, *et al.* Heme oxygenase-1 induction by the clinically used anesthetic isoflurane protects rat livers from ischemia/reperfusion injury. *Ann Surg* 2007;245:931–42.
- 26 Yang LQ, Tao KM, Liu YT, *et al.* Remifentanyl preconditioning reduces hepatic ischemia-reperfusion injury in rats via inducible nitric oxide synthase expression. *Anesthesiology* 2011;114:1036–47.
- 27 Ko JS, Gwak MS, Choi SJ, *et al.* The effects of desflurane and sevoflurane on hepatic and renal functions after right hepatectomy in living donors. *Transpl Int* 2010;23:736–44.
- 28 Song JC, Sun YM, Yang LQ, *et al.* A comparison of liver function after hepatectomy with inflow occlusion between sevoflurane and propofol anesthesia. *Anesth Analg* 2010;111:1036–41.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow