Iodopovidone pleurodesis does not effect thyroid function in normal adults

Ali Yeginsu*, Altemur Karamustafaoglu, Fikret Ozugurlu, Ilker Etikana

Gaziosmanpaşa University School of Medicine, Department of Thoracic Surgery, Cennet Mh. 60500, Tokat, Turkey
Kirikkale Yuksek Ihtisas Hospital, Division of Thoracic Surgery, Kirikkale, Turkey
Gaziosmanpaşa University School of Medicine, Department of Biochemistry, Tokat, Turkey
Gaziosmanpaşa University School of Medicine, Department of Biostatistics, Tokat, Turkey

Received 26 February 2007; received in revised form 24 April 2007; accepted 3 May 2007

Abstract

Iodopovidone is an effective, safe, cheap, and easily available agent for pleurodesis. On the other hand, topical applications of iodopovidone may cause thyroid dysfunction. The purpose of this retrospective study was to determine the effects of intrapleural administration of iodopovidone on thyroid function. Twelve patients have undergone iodopovidone pleurodesis so far. A mixture of 20 ml 10% iodopovidone and 80 ml 0.9% saline solution was administered into the pleural cavity through the chest tube. Thyroid hormone (TSH, TT4, TT3, FT4, FT3) levels were routinely measured just before pleurodesis, and at the 24th and 72nd h of pleurodesis. No statistically significant alteration in thyroid function was determined (P > 0.05). We did not observe any signs or symptoms of hyper- or hypothyroidism in any patient. Nine patients had a complete response to pleurodesis (75%). One patient who had undergone iodopovidone pleurodesis suffered from a moderate degree of transient chest pain. In conclusion, iodopovidone pleurodesis is safe and does not cause any thyroid dysfunction in normal adults.

Keywords: Pleurodesis; Pleura; Iodopovidone; Iodine; Thyroid

1. Introduction

Iodopovidone is a topical antiseptic that has been used for pleurodesis too. It is an effective, safe, cheap and easily available agent that may be an alternative to talc, which is the most commonly used agent [1]. However, iodopovidone may cause alteration in thyroid function after topical application [2]. We retrospectively investigated the effects of iodopovidone pleurodesis on thyroid function.

2. Materials and methods

2.1. Patients

Twelve patients have undergone pleurodesis for various causes so far. We have excluded the patients with renal insufficiency, with hypersensitivity to iodine, and with thyroid disease, for possible side effects of iodine. We have routinely measured serum thyroid hormone (TSH, FT4, FT3, TT4, TT3) levels before and 24th and 72nd h of iodopovidone pleurodesis in all patients.

2.2. Pleurodesis

The procedure was applied via a chest tube at the bedside in all patients. The chest tube (28 F) was inserted into the midaxillary line through the sixth intercostal space and was connected to a water-sealed drainage system. All patients were anesthetized with subcutaneous 0.5–0.7 mg/kg petidin HCl (Aldolan, Gerot Pharmazeutika, Austria) and intrapleural instillation of 20 ml Bupivakain (Marcaine, AstraZeneca, England) before pleurodesis. Fifteen to 20 min after anesthesia, a mixture of 20 ml 10% iodopovidone (Poviodeks, Kim-pa, Istanbul, Turkey) and 80 ml 0.9% saline solution was administered into the pleural cavity through the chest tube, and the tube was clamped. After 2 h, the tube was unclamped and, thereafter, negative pressure (~10 cm-H2O) was applied to the chest tube. The tube was removed when the lung was reexpanded and pleural drainage reduced to under 100 ml/day. Patients were discharged when chest radiography showed a fully expanded lung or no pneumothorax after the tube was removed. Any fluid or air in the thoracic cavity was evaluated as failure.

2.3. Statistics

SPSS 10.0 statistical package for Windows was used for the analysis. Values are expressed as median (minimum−maximum). The Friedman test was used for comparison of nonparametric values.
3. Results

Twelve patients were evaluated. Nine patients were male and the mean age was 61 years (37–74 years). Eight patients had various neoplasms (4 malignant mesothelioma, 4 primary NSCLC), two had nonspecific chronic pleuritis, and two had recurrent pneumothorax. We undertook pleurodesis in patients with pneumothorax because they would not accept surgical treatment. Mean effusion volume was 1335 ml (850–2200 ml). Seven of ten patients had a large volume of pleural effusion (>1000 ml). Maximal, 1000 ml of pleural fluid was allowed to drain in a single stage and the remaining fluid was drained at least 6 h later. No reexpansion of pulmonary edema was encountered. No statistically significant differences were detected in thyroid hormone levels between before and after pleurodesis (Table 1). We did not observe any signs or symptoms of hypo- or hyperthyroidism in the patients during the follow-up period. Nine patients had a complete response, and three had local fluid reaccumulation. One patient suffered from a moderate degree of transient chest pain. The mean follow up was 8.7 (4–16) months. Two patients have died during the follow-up period due to malignancy.

Briassaud et al. reported on three infants with normal thyroid hormone levels before and after (at the 16th day in the first infant, 19th day in the second infant, and 30th day in the third infant) iodopovidone pleurodesis [4]. Olivares-Torres et al. reported on two patients and neither of them presented signs or symptoms of hyperthyroidism, although they performed second iodopovidone pleurodesis to the patients in whom the first was unsuccessful [1]. In contrast to infants, normal subjects without preexisting thyroid disease are able to tolerate systemic iodine uptake well without any physiological disturbance. We think that this toleration capability can explain why iodopovidone pleurodesis did not cause thyroid dysfunction in our patients. Various success rates of iodopovidone pleurodesis have been reported. Kelly-Garcia et al. reported a 64.2% success rate in 14 patients [5]. Olivares-Torres et al. achieved 96.1% complete response in 52 patients with recurrent pleural effusions [1]. Our success rate was 75%.

In conclusion, iodopovidone is a promising agent in pleurodesis. It is cheap, easily available, effective and safe in use. Our findings additionally showed that iodopovidone pleurodesis did not cause thyroid dysfunction in adult patients.

4. Discussion

It was reported that either topical iodopovidone applications or the use of iodine-based contrast agents may cause transient thyroid dysfunction, especially in infants [2]. High concentrations of exogenous iodine are capable of blocking the organic-binding and coupling reactions and decrease thyroid hormone synthesis. Excess iodides may also induce thyrotoxicosis in susceptible individuals [3]. The mechanism of pleurodesing effect of iodopovidone is unknown. It may be related to the low pH (2.97) of the sclerosing solution [1]. Iodine has strong oxidative and cytotoxic properties which induce a potent inflammatory response in the wall of any fluid-containing structure [4]. Indeed, it is not well known how pleural instillation of iodopovidone affects thyroid function except for two little anecdotal notes.

References

[5] Kelly-Garcia J, Roman-Berumen JF, Ibarra-Perez C. Iodopovidone and bleomycin pleurodesis for effusions due to malignant epithelial neo-