IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 7 Ser.1 (July. 2021), PP 36-38
www.iosrjournals.org

An Observational Study on Safety and Efficacy of Povidone-Iodine for Pleurodesis in Cancer Patients

Kamal KishorLakhera, AyushMakkar, SanjeevPatni, Anjum Khan Joad
Departments of Surgical Oncology and Anaesthesia and Palliative Care,
BhagwanMahaveer Cancer Hospital and Research Centre, Jaipur, Rajasthan, India
Correspondence to: Dr Kamal KishorLakhera,

Abstract
Introduction: *Pleurodesis is a time-honored procedure for malignant effusion as one of the palliative procedures to treat recurrent effusions. Various agent have been used in the past such as tetracycline, talc, bleomycin, and povidone-iodine. This paper aims at evaluating safety and efficacy of povidone-iodine for the procedure.*
Materials and Methods: *One hundred and four patients underwent of pleurodesis with povidone-iodine done at our center for malignant effusion between June 2008 and August 2019. The safety and efficacy of the procedure was analyzed.*
Results: *One hundred and four patients of malignant effusion with mean age of 53 years and a mean follow-up of 7.8 months were evaluated. A total of 79% patients did not show any reaccumulation of fluid in their follow-up. There was no periprocedural mortality. Eight patients had severe pain; eleven patients had fever, while one patient had arrhythmia.*
Conclusion: *Povidone-iodine is a simple, cheap, and effective method of pleurodesis with no major complication and a high success rate.*
Key words*: Malignant pleural effusion, pleurodesis, povidone-iodine*

Date of Submission: 17-06-2021 Date of Acceptance: 02-07-2021

I. Introduction

Pleurodesisdefined as symphysis between two layers of pleura to prevent recurrence of effusion. Chemical pleurodesis is the best available treatment for recurrent effusions of incurable malignancies. An ideal agent must be highly effective, easy to administer, safe, inexpensive, and readily available. Such an ideal agent is yet to be identified, and choice depends on the local availability and experience. Povidone-iodine is a topical antiseptic and has been shown to be safe and effective in several series[1-5] including one multicenter study[3] and in two small series.[5,6] Povidone-iodine was selected over the other agents due to its cost-effectiveness and fewer side effects. This study aims to assess the safety and efficacy of povidone-iodine for pleurodesis.

II. Materials and Methods

This study was done to evaluate the efficacy of the pleurodesis procedure with povidone-iodine. One hundred and four cases of malignant pleural effusion that underwent pleurodesis with povidone-iodine for symptomatic effusion at our center from the period of June 2008 to August 2019 were analyzed.

The British Thoracic Society guidelines were followed for managing malignant pleural effusion and for pleurodesis.[7] Chest tube (28F) was inserted through the midaxillary line in the fifth intercostal space to achieve complete drainage of the effusion and lung re-expansion. Re-expansion was verified radiographically. As soon as the effusion was completely drained and the lung fully expanded, pleurodesis was performed. Pleurodesis was done after a mean duration of 11.72 days (range 3–36 days) after the placement of intercostal drain. Lidocaine (4 mg/kg) diluted with normal saline to a volume of 50 ml was infused through the chest tube. Implanted cardioverter defibrillator (ICD) was clamped for 15 min,and patient was advised to change position for distribution of anesthetic agent uniformly. After 15 min, a pleurodesis solution containing a mixture of 20 ml 10% povidone-iodine and 80 ml normal saline solution was infused into the pleuralcavity, after which the tube was clamped for 2 h, and patient was again instructed to change position frequently. After 2 h, the chest tube was unclamped. The intercostal drainage tube was removed as soon as the chest radiograph showed total lung re-expansion and no residual pleural effusion at a mean of 1.8 days (range 1–6 days).

III. Results

Out of 104 cases, 65% of the cases were females and 35% weremale. The mean age was 53 years (range 35–73 years). Allthe patients had recurrent pleural effusion associated withmalignancy. Seventy-six (79%) patients had successfulpleurodesis showing no evidence of reaccumulation of fluid in pleural cavity during their follow-up. Twenty-eightpatients (26.9%) developed re-effusion on follow-up, afterpleurodesis. Carcinoma lung and breast formed the major groupaccounting for 44.2% and 36.6%, respectively. Carcinoma ovarywas the cause in 9 (8.6%) patients. Lymphoma, mesothelioma,and melanoma were the rare cause.

All patients had large amount of effusion (>800 ml) thatwas allowed to drain gradually to prevent pulmonary edema,and pleurodesis was done after assuring complete drainage.Moderate pleural effusion (800–1500) seen in 78 (75%) patientsand gross effusion (>1500) in 36 (25%) patients.There was no periprocedural mortality. Periprocedural painwas managed with oral nonsteroidal anti-inflammatory drugand tramadol. Eight patients (7.7%) had excessive pain andrequired intravenous analgesia round the clock for 3–4 days. Eleven patients (10.6%) also experienced high-grade fever thatsubsided in 2–3 days with antipyretics and oral antibiotics. Fivepatients (4.8%) had ICD wound site infection and one had atransient arrhythmia.The mean follow-up was 7.68 months (range 2–23 months),with 80 (77%) patients died at their last follow-up.

IV. Discussion

Chemical pleurodesis is the procedure of choice in themanagement of recurrent malignant pleural effusions. The bestchoice of sclerosing agent is still debatable. An ideal sclerosingagent should have a high molecular weight and chemicalpolarity, low regional clearance, rapid systemic clearance, anda steep dose-response curve and should be well tolerated withminimal or no side effects.[7] The choice of a sclerosing agentis not only determined by the efficacy of the agent but alsoby its cost, accessibility, safety, ease of administration, andthe number of administrations required to achieve a complete response.

Although talc is effective, there is an increasing concernabout its safety.[8,9] In a study by Walker-Renard*et al*.,[10] talchas been the most effective chemical agent for malignantpleural effusions, with a complete success rate of 93% in1168 patients, compared with *Corynebacteriumparvum*(76%),tetracycline (67%), doxycycline (72%), and bleomycin (54%).The efficacy of povidone-iodine has been previouslydescribed. In a study by Echavarría*et al*.,[1] pleurodesis withpovidone-iodine was performed in 15 patients with malignantpleural effusions and achieved control of the effusion in all thepatients. In another study by Kelly-Garcia *et al*.,[5] success wasachieved in 9 of 14 patients (64.2%) in whom povidone-iodinepleurodesis was performed.

Povidone-iodine is iodine-based topical antiseptic. Themechanism of action of povidone-iodine appears to be relatedto enhanced sclerosis although the precise mode of actionremains unclear. It may be related to the low pH (2.97) ofthe sclerosing solution.[4] Furthermore, iodine has strongoxidative and cytotoxic properties, which can induce a potentinflammatory response in the wall of any fluid-containingstructure. Moreover, povidone-iodine may have anti-exudativeproperties related to the chelation of proteins.[6] Theoretically,the mechanism could also be similar to that described for talc,namely, the production of fibroblast growth factor.[8]Although povidone-iodine does cause chest pain, intensitydescribed in different studies varies as procedural sedationhas been used in most studies. Another side effect reportedwas the occurrence of hypotension in three patients withmesothelioma.[6] However, it was not clear whether thehypotension was an anaphylactic reaction or a pain-associatedvasovagal reaction. However, iodine can cause severe allergicreactions,especially in patients with an allergic diathesis, and one should be prepared to deal with this emergency.

V. Conclusion

The efficacy of povidone-iodine is comparable to that of talc but without the risk of severe complications such as acuterespiratory distress syndrome. Pleurodesis with povidone-iodinecan be performed under local anesthesia with excellenttolerance. In conclusion, povidone-iodine is an effective,safe, readily available, and inexpensive agent for chemicalpleurodesis in cases of recurrent, incapacitating effusions.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References

[1]. Echavarría A, Pinzón V, Barés JP, Fernández E. Intracavitary treatment of malignant pleural effusion with iodine-povidone. Rev Med Panama1991;16:69-74.
[2]. Estrada Saló G, Farina Ríos C, FiblaAlfara JJ, Gómez SebastiánG,Unzueta MC, León González C. Spontaneous pneumothorax: Pleurodesiswith an iodo-povidonehydroalcoholic solution. Arch Bronconeumol2003;39:171-4.

[3]. Olivares-Torres CA, Laniado-Laborín R, Chávez-García C, León-Gastelum C, Reyes-Escamilla A, Light RW. Iodopovidonepleurodesis for recurrentpleural effusions. Chest 2002;122:581-3.
[4]. Brissaud O, Desfrere L, Mohsen R, Fayon M, Demarquez JL.Congenital idiopathic chylothorax in neonates: Chemical pleurodesiswith povidone-iodine (Betadine). Arch Dis Child Fetal Neonatal Ed
[5]. 2003;88:F531-3.
[6]. Kelly-Garcia J, Roman-Berumen JF, Ibarra-Perez C. Iodopovidoneand bleomycinpleurodesis for effusions due to malignant epithelialneoplasms. Arch Med Res 1997;28:583-5.
[7]. Godazandeh G, Qasemi NH, Saghafi M, Mortazian M, Tayebi P. Pleurodesiswith povidone-iodine, as an effective procedure in management ofpatients with malignant pleural effusion. J Thorac Dis 2013;5:141-4.
[8]. Antunes G, Neville E, Duffy J, Ali N; Pleural Diseases Group, Standardsof Care Committee, British Thoracic Society. BTS guidelines for themanagement of malignant pleural effusions. Thorax 2003;58Suppl2:ii29-38.s.
[9]. Werebe EC, Pazetti R, Milanez de Campos JR, Fernandez PP, Capelozzi VL,Jatene FB, *et al.* Systemic distribution of talc after intrapleuraladministration in rats. Chest 1999;115:190-3.
[10]. Campos JR, Werebe EC, Vargas FS, Jatene FB, Light RW. Respiratoryfailure due to insufflated talc. Lancet 1997;349:251-2.
[11]. Walker-Renard PB, Vaughan LM, Sahn SA. Chemical pleurodesis formalignant pleural effusions. Ann Intern Med 1994;120:56-64.

Dr Kamal KishorLakhera, et. al. "An Observational Study on Safety and Efficacy of Povidone-Iodine for Pleurodesis in Cancer Patients." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(07), 2021, pp. 36-38.