Letter to the Editor

Inhalational phytochemicals as possible treatment for pulmonary tuberculosis: Two case reports

Eugene Sherry MDb, Max Reynolds PhDb, Sureshan Sivananthan MB, ChB, MRCSb, Sakiusa Mainawalala Dip Med, Dip Surg, Dip Derm, Dip TBb and Patrick
To the Editor:

*Mycobacterium tuberculosis* infects more than 2 billion people in the world, and it has a high mortality rate with 2 to 3 million people dying annually.\(^1\) Multi-drug resistant strains of *M tuberculosis* have been reported in the majority of countries evaluated and are a pandemic of major importance with control programs costing approximately US $1 billion per year globally.\(^2\) and \(^3\) The development of new treatments is the major focus of current tuberculosis research worldwide.\(^4\) and \(^5\) We have previously described the use of phytochemicals to treat methicillin-resistant staphylococcal infections.\(^6\), \(^7\) and \(^8\) Phytochemicals may also offer an effective and cheaper alternative treatment for tuberculosis. We report a chance finding where an inhaled phytochemical turned the sputum negative in 2 patients with primary pulmonary tuberculosis and also produced a clinical improvement.

**Case 1**

A 41-year-old Fijian female presented with cough, shortness of breath, fever, night sweats, weight loss, and malaise. She had been unwell for 12 months. She weighed 84.5 kg. Abnormal laboratory results included a hemoglobin of 7.0 gm/dL and her erythrocyte sedimentation rate (ESR) was 125. A sputum sample grew *M tuberculosis* (a nonresistant strain). The patient's chest radiograph showed bilateral patchy consolidation, especially in the right lower zone, with areas of cystic luencies suggestive of cavitation in the right upper zone. There were no known risk factors or previous clinical evidence of pulmonary tuberculosis. The patient was married and had 2 children; none of whom was unwell.
Before starting the conventional tuberculosis medication (DOTS-rifampicin, isoniazid, ethambutol, and pyrazinamide) she used the phytochemical to help with her irritating cough. A consent was signed. She inhaled via a standard facemask with an adapter and a single dose (3 mL per canister) of a new purified and concentrated tea tree oil (TTO) (MEGABAC, Nicrosol Labs., Springwood, Queensland, Australia; www.nicrosol.com.au). This TTO (patent and FDA approval pending) is a blend of essential oils extracted from the native Australian plant, *Melaleuca alternifolia*, and concentrated by use of a new patented room temperature extraction protocol. The aerosol canisters used are propelled by nitrogen and deliver a droplet size of 10 microns (Fig 1).

The treatment was used for 10 days, while waiting to start her DOTS program. After 14 days, the patient reported less malaise, improved appetite, absent cough, weight gain, and settled temperature. Sputum cultures at day 4 changed from positive to negative and chest radiograph changes remained unchanged. The patient subsequently underwent her DOTS program.

Fig 1. Standard mask with adapter to hold the aerosol can, upon depressing the can releases the medication in a 10 micron mist.

**Case 2**

A 33-year-old Fijian woman presented with a productive cough, pleuritic pain, shortness of breath, fever, night sweats, 3-kg weight loss, and malaise. She had been unwell for 3 weeks. She weighed 51 kg. Abnormal laboratory results included a hemoglobin of 11.3 gm/dL and her ESR was 80. Diabetes mellitus was diagnosed on admission and glibenclamide (Daonil, Hoechst Marion Roussel, Kansas City, Mo) started (5 mg/day). A sputum sample grew *M. tuberculosis* (a nonresistant strain). The patient's chest radiograph showed bilateral patchy infiltrates with a right pleural effusion. Her father was diagnosed with tuberculosis 21 years ago and treated (he remains well). The patient was not married and had no children. She used TTO to help with her irritating cough. A consent was signed. She inhaled TTO for 5 days in the same manner as the patient in Case 1. She reported no symptoms related to inhaling. At 5 days, her sputum culture was negative. She also reported less malaise, improved appetite, absent cough, 1 kg weight gain, and her temperature had settled. Chest radiograph showed the right pleural effusion to have cleared. The patient then continued treatment with her DOTS program.

These 2 reports suggest the potential of this TTO as a phytochemical treatment for pulmonary tuberculosis. Moreover, this purified TTO at these levels is nontoxic when
used topically, and there is evidence that it is nontoxic if inhaled [all the monoterpenes have been stripped out of the base oil, reducing all of the potential irritation components].

Using phytochemicals in the treatment of such conditions could be cost-effective, possibly not affected by multi-drug resistant organisms and an attractive option for possible mass treatment of tuberculosis in the First and Third worlds. There were limitations to this report in that there were no controls used, but this was not the intention of this paper, it is a report of a chance finding observed when 2 patients inhaled a phytochemical to treat an irritating cough before commencing a DOTS program. These cases provide promising preliminary results and further clinical trials will assist in determining the efficacy of this phytochemical in treating pulmonary tuberculosis. Furthermore, clinical trials will be required to determine where this approach fits with conventional oral medication for tuberculosis (DOTS) and whether it can be used for the mass treatment of tuberculosis cases.

References


Max Reynolds owns Nicrosol Pty. Ltd. which makes MEGABAC, and Eugene Sherry has a 12.5% financial interest in the same company.