

Absence of Iodine/Iodide in Cough/Expectorant Medications: A True Disclaimer or not?

Sir,

Iodine is an essential micronutrient required by all individuals for health and well-being. Iodine serves a crucial role in thyroid physiology by being both a key component of thyroid hormones and by regulating thyroid gland function. The thyroid gland concentrates iodine by an adenosine triphosphate-dependent carrier-mediated mechanism against an electrochemical gradient, and this process is regulated by thyroid-stimulating hormone (TSH). TSH stimulates while excess iodine inhibits all the consequent steps in thyroid hormone biosynthesis, from oxidation and organification of iodide to the secretion of thyroxine and tri-iodothyronine into the circulation.^[1]

Radioactive iodine (I^{131}) is selectively taken up by thyroid, incorporated into iodoamino acids, and deposited in the follicular colloid. The thyroid follicles then gradually and slowly release I^{131} . I^{131} emits destructive beta particles from within the follicles causing damage to only thyroid parenchymal cells with minimal influence on surrounding tissue.^[1] I^{131} is mainly used in the ablation of residual thyroid/metastasis following total thyroidectomy in patients with well-differentiated thyroid cancer. It is also indicated in the treatment of hyperthyroidism in older patients and in those with heart disease, persistent or recurrent Graves' disease after subtotal thyroidectomy, and failure of remission following prolonged treatment with anti-thyroid drugs and in patients with toxic nodular goiter.^[1,2]

During therapy with I^{131} , patients are recommended to avoid/discontinue the use of iodide-containing preparations, iodine supplements, and other medications that could potentially affect the ability of thyroid tissue to accumulate I^{131} for a sufficient time before commencing therapy.^[2,3]

Among the medications containing iodide, are cough/expectorants which are always recommended to be avoided during I^{131} therapies. The real question now arises if cough and expectorant medications truly contain iodide. With extensive search in relation to this regard, it was discovered that few of the older cough/expectorant preparations contained iodide/iodine in substantially large quantities, but preparations of the recent times claim not to contain iodine except for one preparation.

Table 1 summarizes a few important constituents of cough/expectorant combinations prevalent during the late 19th centuries containing iodide. The table also shows some commonly used cough/expectorant combinations during the recent 20th century exhibiting a striking feature of lacking any iodide component in them with one exception.^[3,4]

Table 1: Cough expectorant/mucolytic combinations and their compositions

Older cough/expectorant/mucolytic combinations		
Serial number	Combination	Constituents
1	Expectorants	Potassium iodide 150 mg
2	Expectorants	Ephedrine HCL 8 mg Calcium iodide 150 mg Isoproterenol sulfate 3 mg 6% alcohol
3	Narcotic antitussive with expectorants	Codeine phosphate 10 mg Iodinated glycerol 30 mg Saccharin Sorbitol
4	Narcotic antitussive with expectorants	Codeine 8.4 mg Calcium iodide 152 mg Alcohol 6%
5	Nonnarcotic antitussive with expectorants	Dextromethorphan 10 mg Iodinated glycerol 30 mg Saccharin sorbitol
Newer cough/expectorant/mucolytic combinations		
1	Antitussive	Tripolidine HCL 1.25 mg Phenylpropanolamine 12.5 mg Dextromethorphan 10 mg/5 ml
2	Expectorant	Terfenadine 30 mg Bromhexine HCL 4 mg Guaiphenesin 100 mg/5 ml
3	Expectorant	Ambroxol HCL 15 mg Guaiphenesin 50 mg Ammonium chloride 100 mg Pseudoephedrine HCL 30 mg Chlorpheniramine maleate 2 mg Menthol 1 mg per 5 ml

Contd...

Table 1: Contd...

4	Antitussive with expectorant	Ambroxol HCL 30 mg Salbutamol 1 mg Guaiphenesin 50 mg/5 ml
5	Expectorant	Bromhexine 4 mg Guaiphenesin 50 mg Diphenhydramine 8 mg Ammonium chloride 100 mg Menthol 1 mg
6	Nonnarcotic antitussive with expectorant	Dextromethorphan HCL 10 mg Bromhexine HCL 8 mg Ammonium chloride 100 mg Menthol 5 mg/10 ml
7	Narcotic antitussive with antihistamine	Codeine 10 mg Chlorpheniramine maleate 4 mg
8	Narcotic antitussive with expectorant	Codeine phosphate 7.5 mg Guaiphenesin 30 mg Sodium citrate 195 mg Citric acid 65 mg Phenylephrine HCL 5 mg Chlorpheniramine maleate 1 mg per 5 ml
9	Nonnarcotic with mucolytic	Noscapine 7 mg Ammonium chloride 28 mg Sodium citrate 3.25 mg Chlorpheniramine maleate 2 mg per 5 ml
10	Expectorant (Waterbury's compound)	Creosote 0.0075 ml Elemental iron 3 mg Sodium iodide 1.8 mg Manganese 0.7 mg Guaiacol 0.00035 ml Sodium hypophosphate 18 mg Sodium salicylate 0.135 g Sodium benzoate 18 mg Malt extract 1.05 g Ethanol 9% v/v Total nitrogen 10 mg

The only newer preparation containing iodine is underlined

This preliminary initiative of insight into the iodine/iodide content among the various cough and expectorant medications currently available in contrast

to the older preparations may prove valuable to consider precautionary measures during I¹³¹ therapy to avoid potentially significant drug interactions, where presently, all cough/expectorant medications are contraindicated with an assumption of high iodide content in them.

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Conflicts of interest

There are no conflicts of interest.

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