

treating patients with hyperthyroidism with LS an exacerbation of thyroid hormone levels could be a consequence after a period of blocking the thyroid, as the gland has become loaded of iodine substrate for hormone synthesis [32].

2010  
12 drops  
4x/day  
= 30 mg  
x 4  
= 120  
mg/day

However, in the investigation by Takata et al. a combination of iodide solution was used together with methimazole for up to 8 weeks [33]. Iodide was discontinued when patients showed normal free T4. Eleven patients (25%) escaped from the Wolff-Chaikoff effect, and 3 derived no benefit at all. Moreover, in another study including patients with mild GD who received primary treatment with LS (50–100 mg daily), control of hyperthyroidism after 12 months was comparable with that seen in patients receiving low-dose methimazole treatment [34]. How often

7 years at 100 mg daily!

and how early escape occurs is not clear, but in an observational study from Japan long-term treatment with LS alone or in combination with antithyroid drugs has been used, with 29/44 (66%) being well-controlled on 100 mg LS daily alone for 7 years [35]. In another study of 21 patients with hyperthyroidism given iodide daily, hormone levels started to increase again after 3 weeks in some, but others remained euthyroid even after 6 weeks [36]. Reactivation of thyrotoxicosis could to some extent be explained by a stimulation of the immune system as elevation of TSH receptor antibodies has been noted in euthyroid patients preoperatively with 60 mg iodide twice daily for 10 days [37]. However, in long-term treatment with iodide these antibodies has been reported to decline [35].

pared to controls [45]. The reduced blood loss is associated with both a 60% reduction in systemic angiogenic factor (VEGF) and with 50% of interleukin-16 [46]. If other angiogenic mediators also are involved is unknown. Furthermore, microvessel density, calculated with ultrasound, displayed decreased blood flow after 10 days of 10 drops iodide (74.7 vs. 54.4, mL/min), decreased blood loss (128.6 vs. 108.7 mL) and less expression of CD34 measured with immunohistochemistry [42]. On the other hand, another study demonstrated no difference in blood loss or time of surgical procedure comparing 13 patients on iodide vs. 24 on antithyroid drugs [47].

## Treatment with LS

LS tastes bitter and is also corrosive, and this should be disguised by taking it with a sweet drink such as apple juice. The applied doses come from experience rather than by prospective randomized controlled trials (Table 2). Historically Plummer used 80–320 mg iodide daily and this was established as a pre-treatment before thyroidectomy in GD [1]. However, the efficacy of much smaller doses has also been investigated in the late 1920s to 1960, also in long-term treatment. Thomson et al. found that 6 mg daily iodine induced euthyroidism in most patients [48], and as low doses as 1 mg has also been effective [49]. Reports on escape and the development of antithyroid drugs and radioactive therapy then discouraged physicians from this route of treatment.