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Original Research

European Research on Electrochemotherapy in Head and Neck Cancer (EURECA) project: Results from the treatment of mucosal cancers

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Abstract ***Aim:*** Electrochemotherapy is an effective local treatment for cutaneous tumours and metastases. In this prospective trial, six European institutions investigated electrochemotherapy in recurrent, mucosal head and neck tumours.
Patient and methods: Forty-three patients with recurrent mucosal head and neck tumours and no further curative or reasonably effective palliative treatment options were enrolled and treated with electrochemotherapy. Patients were treated in general anaesthesia using intravenous or local injection of bleomycin followed by delivery of electric pulses to the tumour area. Primary end-point was local tumour response. Secondary end-points were safety and toxicity, overall and progression free survival, and quality-of-life.
Results: Thirty-seven patients were evaluable for tumour response, pain score, side-effects and quality of life questionnaires. Six patients were not evaluable due to lost follow-up, disease progression or death before evaluation. Intention to treat analysis revealed an objective response of 56% (complete response 8 (19%), partial response 16 (37%), stable disease 10 (23%), progressive disease 3 (7%), and not evaluable 6 (14%)). Three patients (7%) remained in complete response at 30, 34, and 84 months post-treatment. The treatment procedure was generally well tolerated. Swelling of the mucosa was observed in the first days after treatment. Pain and use of pain medication rose temporarily; fatigue and dysphagia were also noted in the quality of life assessment.
Conclusion: Electrochemotherapy can be applied to mucosal head and neck recurrent tumours accessible to the procedure with promising objective response, survival and toxicity profile. Attention should be paid to post-treatment swelling and planning of pain medication. These favourable results indicate that electrochemotherapy could play a role in patients with recurrent head and neck cancer.

1. Introduction

The management of recurrent head and neck cancers (HNCs) is challenging when no curative option of surgery or irradiation is left. Available treatment options include chemotherapy, targeted therapies, immunotherapy, re-irradiation and salvage surgery which can lead to further deterioration of existing functional sequelae, disfigurement and/or further impaired quality-of-life.

Electrochemotherapy is a local tumour treatment that uses electroporation to temporarily create permeability of the cell membrane whereby a chemotherapeutic agent can be facilitated into the cell [1,2]. Once inside the cell the chemotherapeutic drug such as bleomycin causes DNA breakage, which results in apoptosis [3]. The treatment can be used as a once-only treatment and has a favourable cost/benefit ratio [4]. It can be offered to patients who have previously been operated, irradiated or have comorbidities precluding conventional chemotherapy. Electrochemotherapy has predominantly been used on skin tumours and skin metastases but research is now moving towards testing the treatment on mucosal tumours [5] and deep-seated tumours [6,7].

A collaboration between several institutions was established to investigate electrochemotherapy in head and neck skin cancer and mucosal cancers: European Research on Electrochemotherapy in Head and Neck Cancer (EURECA). The aim was to evaluate the effectiveness, safety and acceptance in patients with recurrent head and neck cancer. Results from the treatment of skin cancer in the head and neck area have previously been published [8]. These are the results from the treatment of mucosal head and neck cancers.

2. Patients and methods

This multi-institutional study included and treated patients from six European cities (Amsterdam, Barcelona, Bradford, Copenhagen, Ljubljana and Pavia). The study was part of the EURECA protocol under the International Network for Sharing Practice in Electrochemotherapy (INSPECT) Network database with ISRCTNregistry no. ISRCTN78463063. Ethical committee approvals as well as other relevant approvals were obtained by the respective concerned institutions. Data from each institution were prospectively uploaded into the INSPECT database.

The design was a phase II, observational clinical study of administration of bleomycin combined with electroporation in patients with recurrent and/or metastatic HNCs. Patients had to have no other standard treatment options left, severe comorbidities (that preclude other treatments) or declined offered treatments. Primary end-point was local control of the treated lesion. Secondary end-points were safety and toxicity, overall and progression free survival, and quality-of-life.

Inclusion criteria are as follows: histologically verified cancer in the head and neck region; progressive and/or