Periocular basal cell carcinoma: cost of topical immunotherapy versus estimated cost of surgical treatment

Carcinoma basocelular periorcular: custo da imunoterapia tópica versus custo estimado do tratamento cirúrgico

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ABSTRACT

Purpose: The objective of this study was to compare the estimated cost of clinical and surgical treatment for basal cell carcinoma of the eyelid. Methods: This was a pilot study of 12 patients with basal cell carcinoma receiving treatment with 5% imiquimod cream at the ocular plastic surgery center, medical school University of São Paulo (HC-FMUSP, Brazil). The cost of clinical treatment was estimated based on the time of treatment and amount of medication consumed by patients in the home setting. The cost of surgical treatment was estimated by ophthalmologists with experience in reconstructive plastic surgery based on analysis of images of the same patients. Surgeons responded to a questionnaire with four questions about surgical technique, surgical materials required, estimated duration of surgery and type of anesthesia. Results: Immunotherapy lasted from 8 to 12 weeks. All patients reported each cold-stored sachet with 5% imiquimod cream lasted 3 days. According to the institution, a box with 12 sachets costs BRL 480.00. Patients required 1.58-3.11 boxes for complete treatment, corresponding to a total cost of BRL 758.40-1,492.80. Based on image analysis, surgeons evaluated surgery would require 1-3 hours. The estimated cost of surgery room and staff was BRL 263.00, to which the cost of supplies was added. Thus, the total cost of surgical treatment was BRL 272.61-864.82. On the average, immunotherapy was 57.64% more costly than surgical treatment. Conclusions: Malignant eyelid tumors are a common finding in clinical ophthalmology. Surgery is still the treatment of choice at our institution, but immunotherapy with 5% imiquimod cream may be indicated for patients with multiple lesions or high surgical risk and for patients declining surgery for reasons of fear or esthetic concerns. The ability to estimate costs related to the treatment of malignant eyelid tumors is an important aid in the financial planning of health care institutions. Further studies should evaluate the possibility of institutions equating the cost of immunotherapy and surgical treatment by acquiring similar but less expensive medications.

Keywords: Carcinoma, basal cell carcinoma/surgery; Carcinoma, basal cell /economy; Carcinoma, basal cell carcinoma/drug therapy; Eyelid neoplasms; Antineoplastic agents/therapeutic use; Biopsy; Health care costs
INTRODUCTION

Basal cell carcinoma (BCC) is the most common type of periocular neoplasm, with an annual incidence of 10%. In the periocular area, BCC currently represents 20% of all tumors and 90% of neoplasms. The increasing incidence makes it urgent to evaluate treatment costs and financial impacts on public health system.

Considered reliable and effective, surgical excision with safety margins, followed by primary reconstruction of the affected area, is the standard treatment for periocular BCC. However, the periocular region is difficult to manage, requiring special surgical techniques to avoid damage to eyelid function. In addition, surgical treatment often involves the removal of a large amount of tissue in detriment of the patient’s appearance. Several alternative therapies have been proposed to help patients with contraindication for conventional treatment. One of these, immunotherapy with 5% imiquimod cream, has been widely tested and found to be efficacious in the treatment of BCC. It is supposed to be costly, but an economic evaluation, with a cost-outcome analysis, is necessary to estimate the actual contribution of this procedure in skin cancer treatment, in comparison with the reference procedure, ie traditional surgical excision.

Few studies have compared the cost-effectiveness of surgical and clinical treatment for superficial BCC. Exceptions include a study on patients with BCC in the lower limbs and a study comparing dermatological and non-dermatological services. However, no previous study compared the cost of clinical and surgical treatment of BCC in the periocular area.

METHODS

This pilot study, conducted at the Ocular Plastic Surgery Center (HC-FMUSP, Brazil), involved 12 patients with periocular lesions meeting the inclusion criteria for treatment with 5% imiquimod cream. All lesions were nodular BCC confirmed by 2-mm punch biopsy.
Inclusion criteria
- Periocular basal cell carcinoma confirmed by biopsy;
- Clinical contraindication for surgical intervention;
- Refusal to submit to surgery for aesthetic or psychological reasons;
- Signing of informed consent form.

Exclusion criteria
- Previous treatment (in case of recurrence);
- Age under 12 years;
- Pregnancy or breastfeeding;
- Autoimmune disorder or previous inflammatory disease;
- Immunodepression.

The cost of clinical treatment was estimated based on the time of treatment and amount of medication used by patients in the home setting. The cost of surgical treatment was estimated by ophthalmologists with experience in reconstructive plastic surgery based on analysis of images of the same patients. Surgeons were given a questionnaire with four questions about surgical technique, surgical materials required, estimated duration of surgery and type of anesthesia.

RESULTS

Immunotherapy lasted from 8 to 16 weeks. Patients reported that each cold-stored sachet with 5% imiquimod cream lasted 3 days. According to the institution, in 2008/2009 the cost of a box with 12 sachets of 5% imiquimod cream was BRL 480.00.

Patients required 1.58–3.11 boxes for complete treatment, corresponding to a total cost of BRL 758.40–1,492.80 (Table 1).

Based on image analysis, surgeons estimated surgery would require 1–3 hours. Based on earlier studies from the same institution, the cost of surgery room and staff was estimated to be BRL 263.00, to which the cost of supplies was added (Table 2).

Thus, the total cost of surgical treatment was BRL 272.61–864.82. On the average, immunotherapy was 57.64% more costly than surgical treatment.

Table 1
Cost of clinical treatment versus estimated cost of surgical treatment for periocular basal cell carcinoma

<table>
<thead>
<tr>
<th>Patient</th>
<th>Size of lesion (mm)</th>
<th>Boxes (12 sachets) of 5% imiquimod cream consumed</th>
<th>Cost of clinical treatment in BRL</th>
<th>Estimated cost of surgical treatment in BRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11 x 8</td>
<td>1.58</td>
<td>758.40</td>
<td>594.54</td>
</tr>
<tr>
<td>2</td>
<td>11 x 10</td>
<td>2.33</td>
<td>1,118.40</td>
<td>864.80</td>
</tr>
<tr>
<td>3</td>
<td>11 x 9</td>
<td>2.33</td>
<td>1,118.40</td>
<td>601.04</td>
</tr>
<tr>
<td>4</td>
<td>19 x 11</td>
<td>2.52</td>
<td>1,209.60</td>
<td>601.04</td>
</tr>
<tr>
<td>5</td>
<td>12.5 x 5</td>
<td>3.11</td>
<td>1,492.80</td>
<td>502.77</td>
</tr>
<tr>
<td>6</td>
<td>27 x 10</td>
<td>2.33</td>
<td>1,118.40</td>
<td>543.81</td>
</tr>
<tr>
<td>7</td>
<td>5 x 5</td>
<td>1.58</td>
<td>758.40</td>
<td>272.61</td>
</tr>
<tr>
<td>8</td>
<td>5 x 5</td>
<td>2.72</td>
<td>1,305.60</td>
<td>272.61</td>
</tr>
</tbody>
</table>

(*) According to the institution, in 2008/2009 the cost of a box with 12 sachets of 5% imiquimod cream was BRL 480.00

Table 2
Estimated cost in BRL of surgery room and staff at the Ocular Plastic Surgery Center (HC-FMUSP)

<table>
<thead>
<tr>
<th>Breakdown</th>
<th>Month</th>
<th>Day</th>
<th>Hour</th>
<th>Minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resources</td>
<td>34,337.25</td>
<td>2,376.86</td>
<td>237.69</td>
<td>3.96</td>
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<tr>
<td>Facilities</td>
<td>4,885.00</td>
<td>244.25</td>
<td>24.43</td>
<td>0.41</td>
</tr>
<tr>
<td>Depreciation of equipment</td>
<td>200.00</td>
<td>16.67</td>
<td>1.67</td>
<td>0.03</td>
</tr>
<tr>
<td>Total</td>
<td>39,422.25</td>
<td>2,637.78</td>
<td>263.79</td>
<td>4.40</td>
</tr>
</tbody>
</table>

DISCUSSION

Malignant eyelid tumors constitute an important part of clinical ophthalmology. At our institution, surgery is still the treatment of choice, except in patients with high surgical risk, multiple lesions or refusal to submit to surgery for aesthetic or psychological reasons. Such patients may opt for immunotherapy with 5% imiquimod cream. Knowledge of treatment costs is an essential subsidy to the financial planning of health care institutions.

Aguilar et al. evaluated the cost of treatment for superficial BCC in the lower limbs. Surgery was found to be more costly, but also more efficacious, than clinical treatment.(11)

Vanaclocha et al. evaluated the cost-effectiveness of treatment of superficial BCC using surgical excision or 5% imiquimod cream at dermatological and non-dermatological services and found that clinical treatment reduced patient cost compared to surgery.(12) In addition, the cost was higher at non-dermatological services due to more expensive surgical procedures and postoperative care.

Surgical treatment was less costly in our study than in the literature. However, the duration of surgery and need of supplies may have been underestimated by the fact that estimates were based on image analysis. Nevertheless, we believe that even if corrected for this difference, surgery would still be significantly less expensive than immunotherapy, especially in view of the low fixed labor costs of Brazilian public institutions.

The cost of clinical treatment was similar to what has been reported from other countries, but prolonged treatment would be financially unfeasible in the context of Brazilian public health care. The possibility of reducing clinical cost to the level of surgical cost through bulk purchase of less expensive but equivalent brands of medication might be explored in future studies.

REFERENCES