CASE REPORT

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Case report: effectiveness of self-made fluorouracil 5% cream in treating large area of basal cell carcinoma

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ABSTRACT

Background: Basal Cell Carcinoma is slow-growing malignant tumor. It does not usually metastases but can become larger and destructive to surrounding skin. Surgical excision is first-line treatment. Fluorouracil 5% cream (5-FU) is generally not used to treat superficial BCC as it is less effective than imiquimod but may be considered as an alternative in treating small and affected in many parts of body, where surgical excision or other treatments such as cryotherapy are not practical or desirable by the patient. Fluorouracil cream 5% is not available in Indonesia, so we developed our self-made 5-FU from the chemotherapy solution.

Case Presentation: The patients with basal cell carcinoma diagnosed based on the biopsy. The patient has multiple on his forehead. Those patients clinically have red and scaly plaques lesions. After given self-made 5-FU cream that was made from 5-FU chemotherapy solution that was mixed with topical ointment, patients show improvement clinically.

Conclusion: Fluorouracil cream 5% was available in other countries in 50 mg/g. It can be used on superficial BCC patient twice daily for six to twelve weeks. It may be used as an alternative, but it associated with a high rate of recurrence. In Indonesia, there were no availability of Fluorouracil cream 5%. Self-made 5-FU cream may serve as an alternative in treating superficial and large area of basal cell carcinoma.

Keywords: *basal cell carcinoma, topical fluorouracil, alternative therapy*.

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INTRODUCTION

Basal Cell Carcinoma (BCC) is defined as a malignant tumor originating from the basal layer of the epidermis, primarily caused by cumulative sun exposure.[1] It is the most common form of non-melanoma skin cancer, with an increasing incidence worldwide due to factors such as UV radiation exposure and an aging population.[2,3] Epidemiologically, BCC accounts for approximately 80% of non-melanoma skin cancers, with a higher prevalence among individuals with fair skin, particularly those with a history of excessive sun exposure or tanning bed use.[3] Lesions typically appear in sun-exposed areas such as the face, neck, and ears, and although they generally grow slowly and rarely metastasize, they can cause local tissue damage, necessitating effective intervention.[2]

Current treatment modalities for BCC include a range of surgical and non-surgical options. The cornerstone of treatment remains surgical excision, including Mohs micrographic surgery, which offers high cure rates for most lesions.[2] However, when surgery is not feasible or not preferred, particularly in cases of superficial or nodular BCC, various non-invasive therapies such as cryotherapy, photodynamic therapy (PDT), topical chemotherapy with agents like imiquimod and 5-fluorouracil (5-FU), and electrodessication are used.[4] Among these, topical treatments such as 5-FU are particularly valuable for superficial lesions due to their ease of application and favorable toxicity profile.[4]

5-Fluorouracil (5-FU) is a pyrimidine analog that serves as a key component in the topical treatment of several skin malignancies, including superficial BCC.[5] Its mechanism of action involves inhibiting DNA synthesis through interference with pyrimidine metabolism, leading to selective toxicity in rapidly dividing keratinocytes within the tumor.[5] Clinical studies have shown that 5-FU cream, typically used at a concentration of 5%, achieves satisfactory efficacy with manageable side effects such as erythema and ulceration, making it a preferred option for patients seeking a non-surgical approach.[6] Previous research has also indicated that combining 5-FU with cryotherapy may enhance the therapeutic effects and reduce recurrence rates.[6]

In Indonesia, 5-FU cream is not commercially available, limiting treatment options for patients diagnosed with BCC.[7] Given this gap in availability, case reports focusing on the formulation and application of self-made 5-FU cream are essential. This study will explore the outcomes of using this custom formulation in three patients with BCC, providing insights into its effectiveness and tolerability. The experience gained from this case report could be crucial in addressing the unmet needs of patients

Figure 1. Pre-operative appearance of the lesion.

in Indonesia who lack access to standard treatment options for BCC.

CASE REPORT

This case report presents a patient diagnosed with Basal Cell Carcinoma (BCC), confirmed through biopsy. The patient is a 75-year-old male foreign national diagnosed with temporal BCC. He presented with multiple red, scaly plaque lesions on the temporal region, which were subsequently excised (Figure 1 and 2). The anatomical pathology examination revealed baso-squamous cell carcinoma.

As part of the follow-up treatment, the patient was prescribed 5-FU cream. The self-made 5-FU cream was prepared by mixing a 5-FU chemotherapy solution with topical ointment. The patient was instructed on the following guidelines for applying the 5-FU cream: 1) Avoid direct sun exposure, 2) Store the cream in a cool place, 3) The cream's effectiveness diminishes after 72 hours, 4) Apply the cream to thin skin, which will react by becoming red and undergoing desquamation, and 5) New skin will begin to grow after 28 days. Following regular use of the 5-FU cream, the patient showed clinical improvement.

Figure 2. Post-operative appearance of the lesion.

DISCUSSION

The use of 5-fluorouracil (5-FU) cream has emerged as a viable treatment option for patients with superficial basal cell carcinoma (sBCC). 5-FU, a pyrimidine antimetabolite, is primarily indicated for the treatment of actinic keratosis, Bowen's disease, and superficial BCC, offering a non-invasive alternative to surgical intervention.[8] Its mechanism of action involves the inhibition of thymidylate synthase, a crucial enzyme for DNA synthesis and cell proliferation, which ultimately leads to apoptosis of neoplastic cells.[9] This action can be highly beneficial for patients with non-aggressive sBCC who may not require surgical intervention.

Clinical evidence supports the effectiveness of topical 5-FU in achieving tumor clearance. A systematic review showed that 5-FU, particularly at concentrations of 4% and 5%, demonstrated favorable results against skin cancers, including superficial BCC, while maintaining a superior safety profile compared to other field-directed therapies.[10] In practice, patients treated with 5-FU cream have reported substantial clearance rates. For example, the cream is typically applied once or twice daily during a specified treatment period, resulting in histologic and clinical remission rates approaching 80% for sBCC.[11]

Despite its efficacy, the use of 5-FU cream may lead to localized adverse reactions, with the most common side effects being erythema, dryness, and a burning sensation.[12] Severe adverse reactions, such as contact dermatitis, although rare, have also been documented.[13,12] Patients generally tolerate these side effects, but they may affect adherence to the treatment regimen, necessitating patient education about the potential reactions.[14]

Moreover, 5-FU cream is an important consideration for certain patient populations, including the elderly or those who are not optimal candidates for surgical intervention due to comorbidities.[15] In terms of cost, topical treatments such as 5-FU are often more affordable than procedural options, which can be a determining factor for many patients.[8]

However, it is crucial to note that 5-FU is not recommended for invasive basal cell carcinoma. Its effectiveness is limited to superficial lesions, where its application results in the cosmetic loss of the lesion, while the underlying tumor cells may remain. This distinction is important to ensure proper management and realistic patient expectations.[8]

CONCLUSION

5-FU cream is an effective and well-tolerated topical therapy for superficial basal cell carcinoma, providing a non-invasive alternative to surgery. This treatment offers significant advantages in terms of clearance rates and patient compliance due to its ease of use and affordability. However, careful patient selection and management of side effects are crucial to optimize treatment outcomes.

ETHICAL CONSIDERATIONS

The authors stated that this article corresponds to the hospital research protocol and the inform consent has been obtained from the patient.

DECLARATION OF CONFLICTING INTERESTS

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AUTHOR CONTRIBUTIONS

All authors contributed to data gathering, analysis, drafting, and revising and approving the article regarding this research to be published.

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