CASE REPORT

Tyrosine Kinase Inhibitor (Erlotinib)-induced Papulopustular Rash

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Abstract

Erlotinib is a reversible inhibitor of epidermal growth factor receptor (EGFR) tyrosine kinase, competitively inhibiting adenosine triphosphate (ATP) binding at the active site of the kinase. It is approved for treatment of advanced and metastatic cancers. The objective of this report is to find out the cause of the papulopustular lesion while the patient is on tyrosine kinase inhibitor. Our 57-year-old male known case of metastatic pancreatic cancer is on injection gemcitabine 1400 mg (D1 and D8), injection carboplatin 450 mg (D1), and tablet erlotinib 150 mg OD since 1.5 months and after 3 weeks of therapy he developed papulopustular lesions over legs and face which is a side effect of tablet erlotinib and thus it is discontinued and now the patient is being treated for papulopustular lesion by oral and topical antibiotics.

Keywords: Erlotinib, Epidermal growth factor receptor, Papulopustular.

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Case Description

A 57-year-old male, a farmer by occupation, presented in the outpatient department with a complaint of the lesion over the face and legs. He was a known case of metastatic pancreatic cancer and was on treatment for the last 1.5 months. He was on injection gemcitabine 1400 mg (D1 and D8), injection carboplatin 450 mg D1, and tablet erlotinib 150 mg once a day. His complaint was that for the past 2 weeks he had itching over the face and legs and later developed papulopustular rash without any pus discharge from the lesions. On examination, multiple papulopustular rashes were present over both the legs as shown in Figures 1A and B. The lesions are aggravated with exposure to sunlight. On his face, he had blackish plaque along with a papulopustular lesion as illustrated in Figure 1C. Erythema was present around the rashes. There was no evidence of mucositis. No other dermatological or systemic manifestation was present. The laboratory investigations

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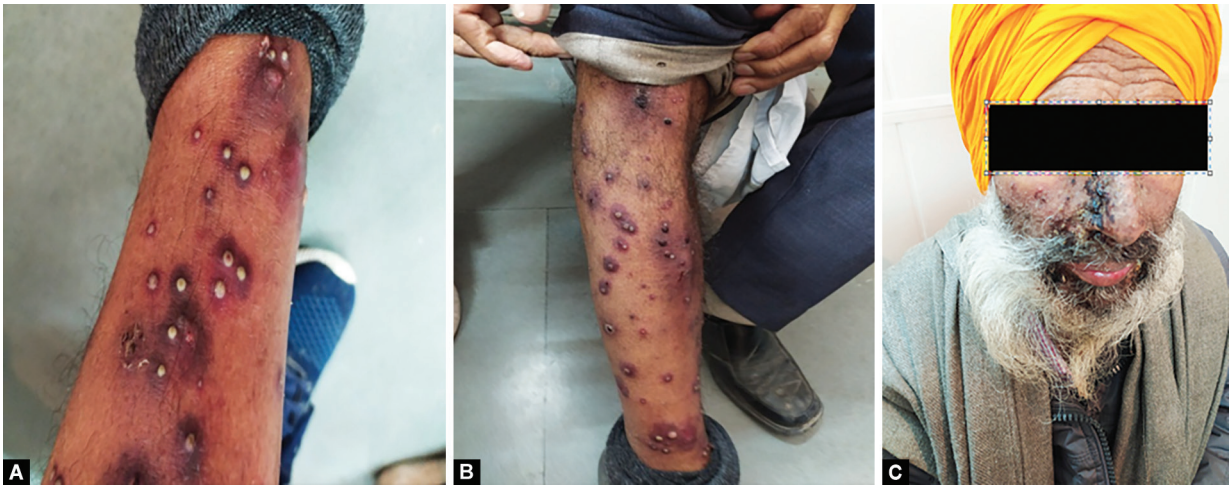

Figs 1A to C: (A) Papulopustular rash over legs; (B) Erythema present around the rashes; (C) Blackish plaque over face

were normal. Hemoglobin was 11.5 gm%, TLC was 11600 mm^3, and platelets were 2.76 lakh/mm^3. Blood urea nitrogen was 17.6 mg/dL and serum creatinine was 0.6 mg/dL. Serum total and direct bilirubin were 0.438 and 0.018 mg/dL, respectively; aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were 36.8 and 26.7 U/L, respectively; alkaline phosphatase was 72.3 U/L; total protein was 7.78 gm/dL, serum albumin 3.62 gm/dL, serum globulin 4.2 gm/dL. He had no history of allergy or any insect bite. As the patient is on erlotinib and it has cutaneous side effects, erlotinib was stopped and the patient was put on an oral and topical antibiotic, he started improving after a week with regression in the lesions. The patient was not given erlotinib or any other tyrosine kinase inhibitor as it may again cause papulopustular lesions. The patient is now started on injection gemcitabine 1400 mg (D1 and D8) and injection carboplatin 450 mg D1 and now with this treatment regimen, the patient had no new lesions.

Discussion

Erlotinib is a reversible inhibitor of the EGFR tyrosine kinase,[1] competitively inhibiting ATP binding at the active site of the kinase thus blocks angiogenesis and cellular proliferation. It is approved for the treatment of patients with advanced non-small cell lung cancer and for metastatic pancreatic cancer along with gemcitabine. The common adverse effects of erlotinib are rash, diarrhea, anorexia, fatigue, dsypnea.[2] Most common cutaneous side effect is a dose-dependent follicular papulopustular eruption on the face, scalp, chest, upper back. It usually develops in the 1–2 weeks, peaks at 3–4 weeks of the therapy, and its intensity decreases after 2 weeks but can often persist over some months.[3] Other side effects such as telangiectasia, hyperpigmentation, exacerbation of radiation dermatitis, oral aphthous ulcer. It has some rare side effects such as gastrointestinal perforation, renal failure, arterial thrombosis, microangiopathic hemolytic anemia, hand foot skin reaction, and corneal ulceration or perforation. The pathogenesis of EGFR-induced skin rash is not fully known. The EGFR is expressed in the basal layer of the epidermis.[4] In papulopustular rash, the main target is keratinocytes. The EGFR receptor in the epidermal keratinocytes plays role in inflammation, barrier function, and innate host defense. It inhibits both EGFR expressed in tumor cells and normal cells in the epidermis. By the inhibition differentiation, all these lead to the release of chemokines from keratinocytes thus leading to infiltration of inflammatory cells.[5] The arrest of growth, the migration of keratinocytes, and inflammation cause xerosis and papulopustular acneiform rash. Papulopustular rash should be treated with topical and oral antibiotics and sun exposure should be avoided. Topical and oral retinoid is not recommended.[6] The 57-year-old male had a papulopustular rash over the face and legs with erythema around the rash in about week 4 of treatment. Thus, tablet erlotinib and injection gemcitabine were withheld and the patient was given an oral and topical antibiotic and was advised to avoid sun exposure. The patient started improving with regression of the rashes.

Conclusion

Erlotinib is an EGFR inhibitor used in the treatment of advanced lung cancer and metastatic pancreatic cancer having a cutaneous side effect of papulopustular rash as a common side effect occurring in 1–2 week peak at 3–4 week of therapy. Early diagnosis and treatment of skin lesions secondary to erlotinib is beneficial to the patient. Written and informed consent was taken from the patient for this case report and the images.

References

1. Goodman LS. Goodman and Gilman's the Pharmacological Basis of Therapeutics. New York: McGraw-Hill; 1996.
2. Owczarczyk–Saczonek A, Witmanowski H, Placek W. Acneiform rash during lung cancer therapy with erlotinib (Tarceva®). Postępy Dermat Alergol 2013;30(3):195. DOI: 10.5114/pdia.2013.35624.
3. Abdullah SE, Haigentz M, Piperdi B. Dermatologic toxicities from monoclonal antibodies and tyrosine kinase inhibitors against EGFR: Pathophysiology and management. Chemotherapy Research and Practice 2012;2012. DOI: 10.1155/2012/351210.
4. Lichtenberger BM, Gerber PA, Holcmann M, et al. Epidermal EGFR controls cutaneous host defense and prevents inflammation. Sci Transl Med 2013;5(199):199ra111. DOI: 10.1126/scitranslmed.3005886.
5. Fabbrocini G, Panariello L, Caro G, et al. Acneiform rash induced by EGFR inhibitors: Review of the literature and new insights. Skin Appendage Disord 2015;1(1):31–37. DOI: 10.1159/000371821.
6. Tsimboukis S, Merikas I, Karapanagiotou EM, et al. Erlotinib-induced skin rash in patients with non-small-cell lung cancer: Pathogenesis, clinical significance, and management. Clinical Lung Cancer 2009; 10(2):106–111. DOI: 10.3816/CLC.2009.n.013.