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**Title:** Incidence and risk factors for development of skin breakdown in patients undergoing prolonged noninvasive ventilation: A case-control study

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**Body:** Among the adverse effects related to the mask, skin breakdown is a frequent complication and its occurrence may increase patient discomfort and failure of noninvasive ventilation (NIV). This study aimed to quantify the incidence and identify potential risk factors for the development of skin breakdown in patients undergoing prolonged NIV. A retrospective, observational study was conducted in the adult intensive care unit of a general hospital. It included 375 patients (between January and December 2011) receiving at least one application of NIV for a period longer than two hours. Cases were subjects who developed skin breakdown and controls were those who did not developed it. The risk factors evaluated were: age, gender, interface, number of applications carried out for more than 2 hours (N>2h), average time of use per application, total time of NIV use, inspiratory and expiratory pressure titrated, and delta pressure. Of the included patients, 49 (13.1%) developed skin breakdown Stage I and 5 patients (1.33%) developed skin breakdown Stage II. Case group presented a higher face mask use (92.6%) than control group (21.5%) (p<0.001). The use of total face mask was lower in case group (7.4%) when compared to control group (78.5%) (p<0.001). The N>2h in case group was 7.1 ± 13.3 and in control group was 4.4 ± 7.5 (p=0.03). Finally, the total time of NIV use was higher in case group (44.6 ± 118.5 h) compared to control group (21.8 ± 45.5 h) (p=0.01). We recommend the use of total face mask in patients expected to use NIV for a period longer than two hours in order to prevent the development of skin breakdown.