Title: Reproducibility and accuracy of a proposed post-acne scarring quantitative global scarring grading system

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Abstract: Assessing post-acne scarring, both by morphology and number, is a key component in planning treatment modalities for scar revision [1, 2]. However, only up until recently has a global quantitative grading system been proposed for assessing disease load and global severity [3]. This scar grading system summarized by Goodman et al. allows for more objective evaluation of post acne scarring, by assigning subjects scores from 0 to 84 depending on scar count, type, and severity as seen on 2D facial photographs. This grading system was evaluated with ten subjects’ 2D facial imaging. Reproducibility of the results among 4 medical students, 3 residents and 2 attendings was only moderately achieved (inter-class correlation coefficient = 0.55). When this data was stratified by training level, reproducibility was noted to increase with increased level of training and experience ranging from fair for medical students (inter-class correlation coefficient = 0.38) to moderate for residents (inter-class correlation coefficient = 0.56) to almost perfect agreement for attendings (inter-class correlation coefficient = 0.89). Though this is reasonably expected, this suggests against this grading system’s reliability among all medical staff. Accuracy of this grading scale, however, was remarkably high. The correlation coefficient of the combined grader’s median scores to computer generated total volume calculations of 3D facial imaging of each subject was 0.965, with similarly high correlation coefficients when graders were stratified by education level. This suggests that this proposed method functions as an accurate acne grading system. However, graders should have prior experience with this grading system to ensure reproducibility and accuracy.