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EP585 - ECE_2757 - Heterogeneous fatty acid–binding protein 4 (FABP4) responses after Roux-en-Y gastric bypass reveal adipokine remodeling dissociated from weight loss, inflammation, and incretin dynamics

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Background: Fatty acid–binding protein 4 (FABP4) is an adipokine closely linked to adipose tissue mass, low-grade inflammation, and cardiometabolic risk. Following bariatric surgery, FABP4 is generally expected to decrease in parallel with weight loss and improvements in inflammation. However, whether postoperative FABP4 dynamics uniformly reflect these changes or exhibit heterogeneous patterns independent of anthropometric and hormonal adaptations remains unclear.

Methods: Twenty-eight adults undergoing Roux-en-Y gastric bypass (RYGB) were prospectively followed at baseline, 3 months, and 6 months. Anthropometric measures, body composition, metabolic indices, hsCRP, IL-6, fasting GLP-1 and PYY, and serum FABP4 were assessed. The 3-month time point was included to capture early postoperative metabolic and adipokine dynamics, whereas primary analyses focused on baseline-to-6-month changes to reflect more stable biological adaptations. Patients were classified as FABP4 responders (decrease from baseline to 6 months) or rebound/non-responders. Longitudinal changes were analyzed using Friedman tests, and between-group comparisons were performed using nonparametric methods.

Results: RYGB induced early and progressive anthropometric improvement, with BMI decreasing from 51.5 [48.1-55.2] kg/m^2 at baseline to 42.8 [39.6-46.9] at 3 months and 35.6 [32.4-38.9] at 6 months ($P < .001$). Systemic inflammation improved in parallel: IL-6 declined from 3.18 [2.27-4.44] pg/mL at baseline to 2.95 [2.31-3.82] at 3 months and 1.68 [0.96-2.95] at 6 months ($P = .00015$), while hsCRP decreased significantly over time ($P < .001$). In contrast, FABP4 trajectories demonstrated marked inter-individual variability. At 3 months, FABP4 changes showed no consistent directional pattern, despite early weight loss and improvement in inflammation. By 6 months, 46% of patients exhibited no decrease or a rebound in FABP4 levels. FABP4 responders experienced less pronounced BMI reduction compared with rebound/non-responders (ΔBMI −14.2 [−16.8 to −11.9] vs −18.6 [−21.4 to −15.1] kg/m^2; $P = .03$). Changes in FABP4 were not significantly correlated with changes in BMI, fat mass, hsCRP, or IL-6 (all $P > .05$). Fasting GLP-1 and PYY levels did not differ between FABP4 response groups.

Conclusions: Despite expected improvements in weight and systemic inflammation after RYGB, FABP4 responses are heterogeneous and only weakly related to anthropometric, inflammatory, or fasting incretin changes. These findings suggest that FABP4 reflects individualized adipose tissue–specific adaptive remodeling rather than a simple surrogate of weight loss or of improvements in inflammation following bariatric surgery.