Aim: The purpose of this study was to evaluate the serum levels of lipoprotein-associated phospholipase A2 (Lp-PLA2) and high sensitive C-reactive protein (hs-CRP) in hyperlipidaemic rats with periodontitis. Material and Methods: Thirty nine adult Wistar rats randomly divided into 4 groups as follows: control group (C); hyperlipidemic group (H); periodontitis group (P); and hyperlipidaemic-periodontitis group (HP). Hyperlipidaemic groups were fed with diet containing cholesterol 2% during 8 weeks to induce hyperlipidemia. On the last 2 weeks, ligature was placed subgingivally around upper second molars to induce periodontitis. Histomorphometric and histological analysis were performed. Serum lipids, Lp-PLA2 and hs-CRP concentrations were evaluated by ELISA. Results: Alveolar bone loss (ABL) was significantly higher in the H, HP, and P groups than the C group (p < 0.05). When compared with the C group, Lp-PLA2 levels were higher in the p and HP groups (p < 0.05), and the H group (p > 0.05). Serum hs-CRP levels did not exhibit significant differences among the study groups (p > 0.05). There was a positive correlation between ABL and low density lipoprotein (r = 0.421, p = 0.008). Conclusion: In the presence of hyperlipidaemia, increased ABL leads to consider that the impaired lipid metabolism may play an important role in the periodontal breakdown. Moreover, LpPLA2 could be an inflammatory indicator in the mechanism between hyperlipidaemia and periodontitis.