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PCSK9 Vaccine Nanoliposomal Ameliorates Glucose intolerance and insulin Resistance in Diabetic Rate.

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Case Study: PCSK9 inhibitors have emerged as an effective lipid-lowering approach. Although the results of available studies suggest a positive association of plasma PCSK9 levels with glycemic parameters and risk of DM, the effects of PCSK9 inhibitors on glucose intolerance and insulin resistance as the key features of DM remain unclear.
Methods:- Nanoliposomal vaccine composing from PCSK9-linked nanoliposome particles mixed in Alum adjuvant was subcutaneously injected four times with bi-weekly intervals in Wistar-Albino rats. Two weeks after the last immunization, vaccinated and non-vaccinated rats were subjected to diabetes experiment induced by single intraperitoneal injection of streptozotocin (STZ). One week after STZ injection, glucose tolerance ability of each animal was evaluated by using oral glucose tolerance test (OGTT) on the overnight fasted rats with glucose dose at 2 g/kg. Two weeks after STZ injection, insulin tolerance test (ITT) viaintraperitoneal injection of insulin (0.8 U/kg) was performed to determine the measure of peripheral utilization of glucose. The plasma concentrations of total cholesterol (TC), LDL-C, HDL-C, and TG were measured.
Conclusion:PCSK9 inhibition using liposomal vaccine can protect from glucose and insulin tolerance impairments in diabetic rats through an unknown and pancreatic-independent mechanism.
Results: Vaccine exposing PCSK9 peptide was found to provoke high-titers IgG antibody response against PCSK9 in rats, which was associated with the decrease plasma levels and function of plasma PCSK9. During the first week after STZ injection,ITT analysis showed that after insulin administration blood glucose level was decreased by 49.3% in the VS group compared with the DC group. The VS rats showed significantly lower (−26.65%, p=0.02) plasma LDL-C levels than the DC rats (Figure) Histopathology examination of the liver tissues of both VS and DC rats exhibited the normal histology with the normal hepatic architecture composed of hepatic lobules with normal central vein.