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BACKGROUND

- Lipofundin® MCT/LCT 20% increase left ventricular systolic pressure in an ex vivo rat heart model via increase of intracellular calcium level¹.
- Systemic blockage** of nitric oxide synthase by L-NAME increases left ventricular systolic pressure, which is not augmented further by Intralipid®².
- ILE has **cardiac inotropy**, makes **vascular contraction** and has other mechanisms¹⁻³.
- Diabetes mellitus is a disease that makes **vascular endothelial dysfunction** due to hyperglycemia and high free fatty acids⁴.
- The goals of this study is to examine the hemodynamic effects of lipid emulsion in diabetic rats.

MATERIAL AND METHODS

- 17 weeks diabetic rats(n=7) and 17 weeks non-diabetic rats(n=7).
- Diabetes was induced with **Streptozocin(80mg/kg) intraperitoneal injection** at 8weeks male rat.
- After 9 weeks, we examined blood glucose level and weight of all rats.
- Femoral vein was cannulated for drug injection.
- A micro-manometer catheter was advanced into the right internal carotid artery.
- Intravenous Lipofundin® MCT/LCT 20% 3ml/kg** was injected.
- After 5minutes, we measured systolic (SBP), diastolic (DBP), mean blood pressure(MBP), heart rate(HR) and rate pressure product(RPP) with digital analysis system (LabChart 7: ADInstruments, Inc., USA).

STATISTICAL ANALYSIS

- Values are expressed as **mean ± SD**.
- Statistical analysis was performed using **independent-samples t test**.

RESULTS

- Mean blood glucose was higher in DM group(380mg/dL) than non-DM group(192mg/dL) (p<0.05).
- Mean body weight was higher in non-DM group (396g) than DM group(232g)(p<0.01).
- DM group resulted in a limited increase of systolic blood pressure(138%)** than non-DM group(177%) (p<0.01).
- DM group showed limited increase of rate pressure product(123%)** than non-DM group(160%)(p<0.01).

RESULTS

| | Glucose (mg/dL) | | Weight(g) | |
|------|-----------------|--------|-----------|--------|
| | Non-DM | DM | Non-DM | DM |
| Mean | 191.9 | 380.4* | 369.3 | 231.9* |

Table 1. Blood glucose level and weight in DM and non-DM rats. * p<0.05 compared to non- DM group.

| Serum lipid | Mean |
|-------------|--------------------|
| cholesterol | DM 104.6 ± 6.7 |
| | Non-DM 102.3 ± 4.1 |
| TG | DM 80.9 ± 7.8 |
| | Non-DM 80.6 ± 10.5 |
| HDL | DM 51.1 ± 12.2 |
| | Non-DM 45.3 ± 7.5 |
| LDL | DM 37.3 ± 14.9 |
| | Non-DM 40.9 ± 6.0 |

Table 2. Serum cholesterol, TG, HDL, LDL level of DM and non-DM group.

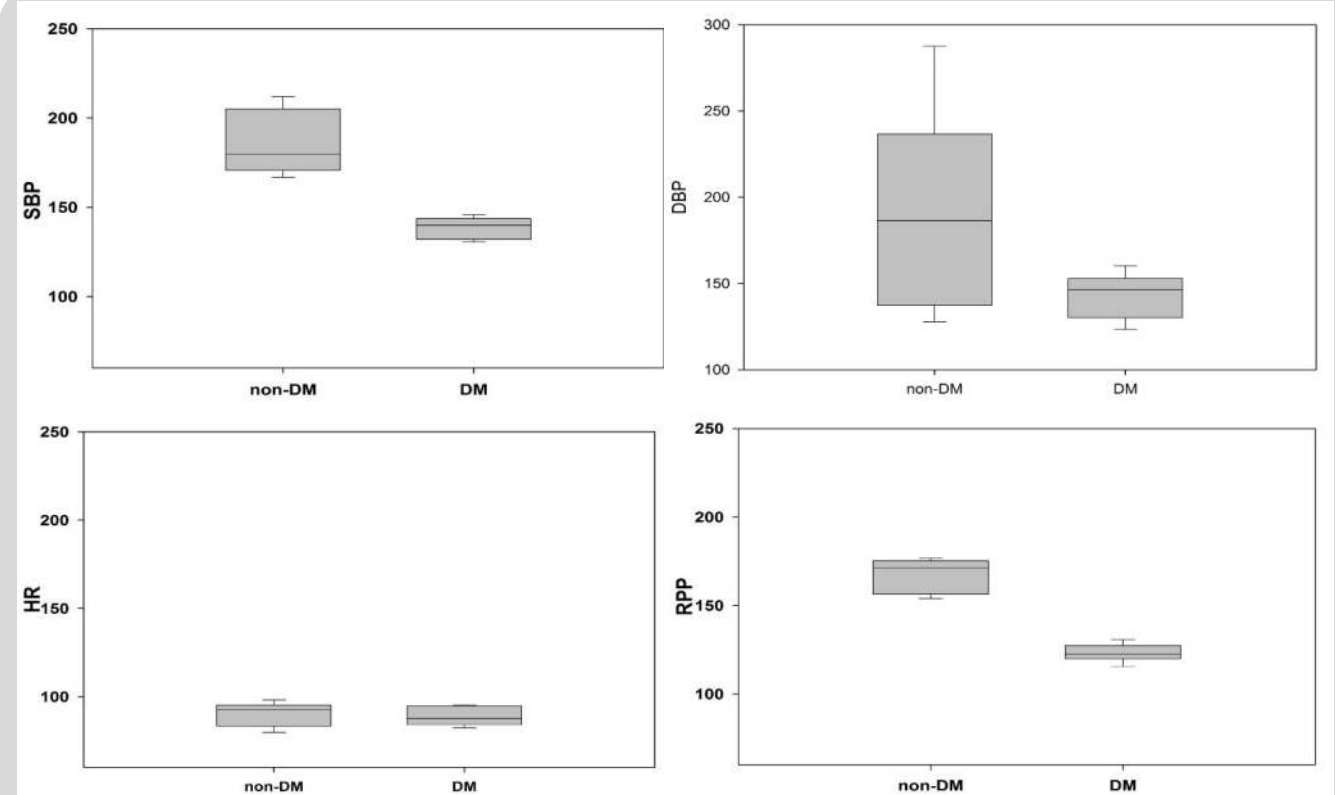


Figure 1. The effect of lipid emulsion in diabetic and non diabetic rats on the hemodynamic parameters including systolic blood pressure(SBP), diastolic blood pressure(DBP), heart rate(HR), rate pressure product(RPP). Values are means ± SD (n = 7/group). N indicates the number of heart. † p < 0.01 compared to the non-DM group.

CONCLUSIONS

- The **hemodynamic effects of intravenous lipid emulsion are limited in diabetic rat model**.
- ILE had a limited impact on vascular contraction as **bioavailability of endothelial NO had been already reduced before the injection of LE due to their diabetes**.
- It is also considered that diabetic rats' **vascular smooth muscle dysfunction may have led its limited impact** on cardiovascular effects.- ongoing

REFERENCES

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