Aerobic Exercise vs. Resistance Training on Insulin Sensitivity

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Insulin sensitivity is something that is on the forefront of health issues today. One of the largest epidemics of our generation is obesity, which is associated with insulin resistance and can lead to the development of Type 2 Diabetes as well as cardiovascular disease. Insulin is utilized in the body to breakdown glucose in the blood. Individuals with decreased insulin sensitivity have higher levels of glucose in their blood which leads to the buildup of fat in the body. This buildup can develop into obesity, diabetes, and even cardiovascular disease or hypertension. Cardiovascular disease is one of the leading causes of death in America and is directly related to decreased insulin sensitivity. Due to this fact, there is much research on the effect of insulin resistance and how to improve insulin sensitivity. After a review on these studies, it is determined that while both options increase insulin sensitivity, Aerobic Exercise (AE) shows slightly more significant improvements than Resistance Training (RT).

Exercise is known to improve a variety of physiological and psychological issues including disease prevention, stress reduction, energy expenditure, and increased insulin sensitivity. A study by Lee et al. researched the different effects of AE and RT on insulin sensitivity using obese adolescent boys. It was found that while both AE and RT show improvements in body fat and lipid profiles, only RT showed a significant improvement in insulin sensitivity within the body. However, the majority of research refutes this finding. A majority of the research reviewed shows that there is a greater impact on insulin resistance with AE. A study by Ryan showed that AE increased insulin sensitivity in insulin resistant older men. In further support, an experiment by Lee et al. showed a significant increase in peripheral insulin sensitivity of 1.10 + 0.07 (P = 0.0002) while RT only yielded an increase of 0.07 + 0.26 (P = 0.793). This demonstrates that while RT does increase insulin sensitivity, it does not reflect as significant of an improvement as AE.

Due to the varying results, it is important to review research studies directly comparing RT and AE. This can be seen within a study by Bacchi et al. comparing the effects of RT and AE on insulin resistance showed that a greater effect was found in participants completing AE than RT. There was an increase in about 30% and 15% in AE and RT, respectively. It was concluded that the increase in insulin sensitivity in AE was due to the improvements in VO2 peak. According to Nikseresht, it was shown that AE leads to suppression of tumor necrosis factor-alpha which protects against insulin resistance in healthy adults and can help reverse resistance in unhealthy adults. This study also found that when testing RT, TNF-alpha was not affected. While RT showed some improvements, it was aerobic exercise that showed the most significant improvements in TNF-alpha levels and slightly higher improvements in insulin resistance.

Reviewing the research on these two aspects, it is apparent that much of the research is inconclusive and contradictory. While more research must be done in order to conclusively determine whether RT or AE is more effective in increasing insulin sensitivity, the current research does support AE to have a more significant effect than RT. Because of these results, it is important to recommend an exercise program featuring AE for someone with insulin resistance. Due to the proven improvements in both exercise regimens, many sources state that the most effective way to increase insulin resistance is to combine the two exercises, RT and AE. The best advice for an individual with insulin resistance is combining the two, which will lead to increase strength and VO2 max. Both of these improvements can contribute to the increase in insulin sensitivity.
References


