

HydroWorx Metabolic Cost Comparison

Metabolic Cost Comparison of Running on an Aquatic Treadmill with Water Jets and Land Treadmill with Incline



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Purpose:

This study was conducted to **compare the metabolic cost (MC) at specific inclines while running on a land treadmill (TM) to running speeds on an aquatic treadmill (ATM) with selected jet resistance.**

Methods:

Sixteen male and female adults who were well-trained runners participated in the study. During each trial, 3 things were recorded: oxygen consumption (VO₂), heart rate (HR) and rating of perceived exertion (RPE). All subjects participated in three different sessions. The first session was a familiarization session understanding the participant's body. The other two sessions consisted of either running on land or on the aquatic treadmill. **These sessions began with a 5 minute warm-up and each participant completed 18 trials. Each trial lasted a minimum of three minutes or until steady state was reached. Steady state was defined by two 60-s averages of VO₂ within 2 ml/kg/min.**

Results:

During the first few stages of running at slower speeds, the MC was greater on the TM than on the ATM with low jet resistance. When there was an increase in speed on the TM and an increase in jet resistance on the ATM the MC were comparable to one another. **However, when jet resistance was 100% on the ATM, the MC was greater than a 10% incline on a TM.** HR followed a similar pattern to VO₂ for all speeds, while RPE changed with different speeds and then became similar as the speed increased.



Conclusion:

The differences between MC and jet resistance on an ATM is much different than TM incline. During an increase in speed and incline TM shows a linear increase in MC, while ATM shows a more cubic change in MC. **Running with selected jet resistance on an aquatic treadmill results in a greater change in metabolic cost than running on a land treadmill.**



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