**Energetics and mechanics of running men: the influence of body mass.**

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We investigated the relationship between mechanical and energy cost of transport and body mass in running humans. Ten severely obese (body mass ranging from 108.5 to 172.0 kg) and 15 normal-weighted (52.0-89.0 kg) boys and men, aged 16.0-45.8 years, participated in this study. The rate of $O_2$ consumption was measured and the subjects were filmed with four cameras for kinematic analysis, while running on a treadmill at 8 km $h^{-1}$. Mass specific energy cost ($C_r$) and external mechanical work ($W_{ext}$) per unit distance were calculated and expressed in joules per kilogram per meter, efficiency (η) was then calculated as $W_{ext}$ x $Cr^{-1}$ x 100. Both mass-specific $C_r$ and $W_{ext}$ were found to be independent of body mass (M) ($C_r$ = 0.002 M + 3.729, n = 25, $R^2$ = 0.05; $W_{ext}$ = -0.001 M + 1.963, n = 25, $R^2$ = 0.01). It necessarily follows that the efficiency is also independent of M (η = -0.062 M + 53.3298, n = 25, $R^2$ = 0.05). The results strongly suggest that the elastic tissues of obese subjects can adapt (e.g., thickening) to the increased mass of the body thus maintaining their ability to store elastic energy, at least at 8 km $h^{-1}$ speed, at the same level as the normal-weighted subjects.