

were reached first with the non-operated leg (NoOp) and then with the operated leg (Op). The outcome was normalized upon leg length ((distance cm/leg length cm) \times 100). The pre-post surgery and the side-to-side difference in SEBT scores in A, PM, and PL directions were calculated pre- and post-TAR and compared through a paired sample *t* test ($p < 0.05$).

Results: Considering the pre- and post- surgery evaluation of the replacement ankle, all SEBT have improved (A pre = 57.3, post = 58.1, $p > 0.05$; PM pre = 71.9, post = 75.3, $p > 0.05$; PL pre = 53.1, post = 60.6, $p < 0.05$). Moreover, the outcomes of the healthy leg improved, even though the results were not statistically significant ($p > 0.05$). Concerning the side-to-side differences, a significant reduction was found for PL direction ($p = 0.004$, Cohen's *d* = 0.79) but not for the A and PM directions ($p > 0.05$).

Conclusions: The results of the study showed that the SEBT outcomes in patients with TAR improved after the implantation of the prosthesis. Indeed, the side-to-side difference between the Op and NoOp leg decreased, showing an improvement in dynamic balance and mobility. On the whole, the ankle prosthesis allows to partially restore symmetrical levels of dynamic balance between Op and NoOp legs measured through the SEBT.

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OP3—Validity of the Italian version of the talk test

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Purpose: Talk Test (TT) is commonly used as surrogate of maximal testing exercises due to its simplicity, validity and easily expose to determine exercise intensity in several populations. Since only few study validated its use in different languages, this study aimed to determine the validity of the Italian version of TT in healthy young adults.

Methods: Thirteen (female = 5; male = 8) young adults (age: 24.7 ± 3.0 years, body mass: 67.6 ± 14.9 kg, body height: 1.7 ± 0.7 m, BMI: 22.0 ± 4.3 kg/m²) participated in this study. Subjects performed one TT and one submaximal exercise test (SET) with respiratory gas analysis on a treadmill. The testing sessions consisted of a 3-min warm-up with a slope of 1% (fixed for the tests' execution time) at a comfortable subjectively speed of 60-65% of maximal heart rate (HRmax). The speed was increased by 1 km/h every 2 min (each stage) and subjects were required to rate their perceived exertion (RPE) on a 0 (rest)—10 (maximal effort) scale. At 1.5 min into each stage of the TT protocol, subjects were required to recite the Italian version of the Olympic Oath "I promise that we shall take part in these Olympic Games, respecting and abiding by the rules which govern them, committing ourselves to a sport without doping and without drugs, in the true spirit of sportsmanship, for the glory of sport and the honor of our teams". Immediately after reciting the speech, subjects were asked "Can you speak comfortably?" with three possible answers: "Yes", "Not sure" or "No". Tests were stopped if subjects: reached the 90% of HRmax; "No" as answer and subjects' fatigue. RPE and running speed values were averaged for the tests. Independent *t*-test was used to compare RPE and speed within TT and SET. Linear regression analysis (R2) to assess the relationship between TT and SET was used. Root mean square error (RMSE) was also calculated and statistical significance was set at $p < 0.05$.

Results: No differences ($p < 0.05$) were found between tests within RPE (TT: 3.4 ± 1.2 ; SET: 3.1 ± 1.3 AU) and speed (TT: 8.2 ± 1.5 ; SET: 8.9 ± 1.8 km/h). Strong and very strong linear relationship were found for RPE ($R^2 = 0.79$; RMSE = 0.58, $p \leq 0.0001$) and speed ($R^2 = 0.95$; RMSE = 0.40, $p \leq 0.001$) between TT and SET.

Conclusions: The strong relationship between the TT and SET indicated that TT might be a valid tool to assess exercise intensity when maximal tests with respiratory gas analysis are impractical due their sophisticated technologies and cost.

OP3—B-thalassemia patients show decreased efficiency of the neuromuscular function associated with chronic tissue hypoxia

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Purpose: Increased muscular fatigue in β -Thalassemia patients has been related to a combination of lower hemoglobin levels, lower cardiac efficiency, or increased deconditioning. Challenging this hypothesis, we studied the neuromuscular function in these patients, evaluating its possible association with chronic tissue hypoxia.

Methods: In a cross-sectional study, neuromuscular, hematological, biochemical and clinical features of patients affected by Transfusion-Dependent β -Thalassemia (TDT) or Non Transfusion-dependent β -Thalassemia (NTDT) were analyzed and compared to healthy subjects. Estimates of neural drive were obtained during submaximal isometric contractions by decomposing high-density electromyographic signals into the activity of individual motor units from the *vastus medialis* and *vastus lateralis* muscles. Muscle fiber conduction velocity (MFCV) was measured as an indirect estimate of average muscle fiber size. Serum HIF1 α and HIF2 α were measured by ELISA.

Results: A total of 36 subjects (15 healthy, 10 NTDT, 11 TDT) were enrolled in the study. Median age was 29 (range 20–43), 50% were female. Knee extension mean torque was lower in TDT group ($P = 0.038$), controlled for all relevant covariates, including GPAQ. When controlling for recruitment threshold and discharge rate at recruitment, the motor unit discharge rates were higher ($P = 0.014$) in TDT (12.0 ± 0.3 Hz) than in healthy controls (10.9 ± 0.2 Hz), while MFCV was lower ($P = 0.027$) in TDT (4.8 ± 0.5 m/s) than in healthy controls (5.3 ± 0.5 m/s). NTDT showed intermediate values for all parameters considered above. Serum HIF1 α levels were 4.3 ± 4.3 , 2.9 ± 1.9 , and 24.9 ± 42.2 ng/mL in healthy, NTDT and TDT, respectively ($P = 0.056$). HIF2 α levels did not differ significantly among groups. Both HIF1 α and HIF2 α correlated negatively with max torque exercised (Spearman's $\rho = -0.355$, $P = 0.036$ and $\rho = -0.416$, $P = 0.013$, respectively) and with MFCV ($\rho = -0.43$, $P = 0.02$ and $\rho = -0.60$, $P < 0.001$, respectively).

Conclusions: The increase in neural drive required to produce knee extension torques suggests lower efficiency of muscle tissue in β -Thalassemia patients. Chronic tissue hypoxia is associated with these features and could contribute to explain such modifications.