INTRODUCTION
The overwork weakness (OW) problem in CMT disease has been debated for long time. It has been reported that the non-dominant hand (NDH) of patients with CMT disease is stronger than the dominant hand (DH) as a result of OW and some authors verified this hypothesis using MRC on different muscles (Van Pomereren, 2009). More recently, Piscosquito et al. (2014) found that the OW phenomenon does not exist using a dynamometer and the 9 hole peg test, a dexterity test. We propose our evaluation with Thumb Opposition Test, Strength Test with a dynamometer and a Sensor Engineered Glove Test (SEGT).

MATERIALS & METHODS
Patients enrolled:
• n: 56 CMT patients (28 M; 28 F)
• N: 24 healthy controls (9 M; 13 F)
• Age range: 22 – 79

Tests Performed and compared
• Thumb Opposition Test (TOT)
• Dynamometer (tripod pinch & hand grip)
• SEGT (FT & IMRL @ MV)

SEGT is an engineered glove which measures severity of hands dysfunction in CMT patients (Alberti et al., 2015)

SEGT protocol:
Patient:
• Eyes closed
• Relaxed
• Alternating Hands

Duration: 30 sec

Protocols:
• FT at max velocity (MV)
• Sequence (IMRL) @ max velocity (MV)

Parameters evaluated:
• Touch Duration (TD) in ms
• Inter-tapping Interval (ITI) in ms
• Movement Rate (MR, 1/TD+ITI) in Hz

Thumb opposition test
In the Healthy Subjects there is no significant difference between DH and NDH, on the contrary in CMT patients TOT is significantly higher in the NDH.

TOT is a measure of opposition ability. In CMT patients, opposition is severely impaired by interosseous atrophy and hands deformities.

CONCLUSIONS
In conclusion, this is the first study which supports the existence of the overwork weakness in CMT that matches different kind of measures. Overwork weakness is evident in the TOT. Furthermore, the strength of the hand is compromised too. In fact, according to the 10% rule (Noguchi & Demura, 2009) we should expect a higher strength in the DH. Interestingly, even the measures of hand dysfunction, as is the SEGT, support this hypothesis. We speculate that compensating movements in the weaker hand of CMT patients impairs the dexterity on both hands. Finally, our results support the importance of avoiding supramaximal exercises and educating the CMT patients to prevent incorrect movements, which may overload the hand muscles and may impair the hands function. As future perspectives, we will enlarge the number of CMT patients and healthy controls to have more reliable statistics.