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## Physical Exercise as a therapy for dysmetabolic patients? Compliance and efficacy

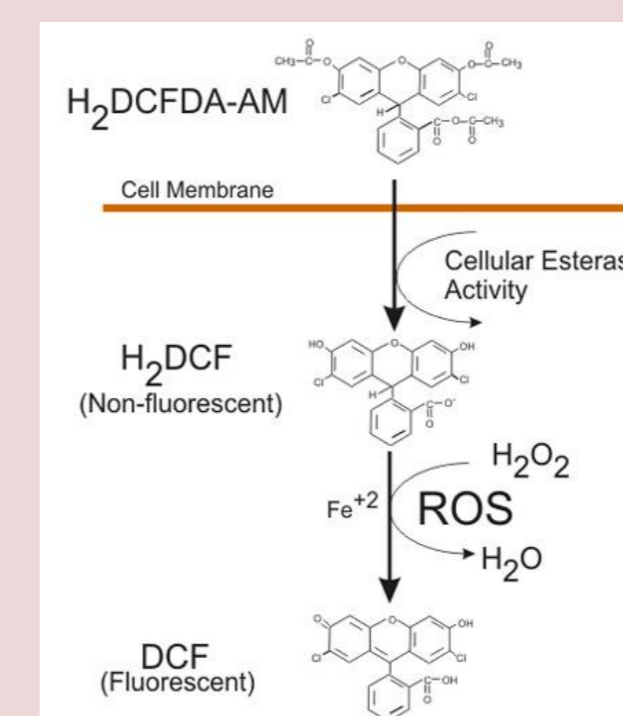


Diabetes mellitus is a group of metabolic diseases associated with long-term damage, dysfunction, failure of various organs. Metabolic profile of patient can be improved by regular physical exercise that remarkably affects biochemical indexes. Nonetheless patient ability to comply is lower than pharmacological therapies and its benefits are rapidly lost if discontinued. In this study we compare the hemato-biochemical outcomes of a 3 months trial in 19 type II Diabetic patients instructed to perform a daily exercise program according to a counseling with/without support of a wearable accelerometer enabling a feedback on the patient Daily Training Level (DTL). The participants of the study were distributed according to the level of physical activity recorded by a wearable accelerometer during everyday activity and during physical exercise sessions. Data was recorded as MOVE which derives from a conversion of frequency sampled into counts, these in turn are transformed into MOVE through a suitable algorithm. According to total MOVE patients were divided in three groups of equal numerosity with group A including more active patients (daily average: 860±136 MOVE), group B intermediate activity (daily average: 674±37 MOVE); group C low activity (daily average: 462±183 MOVE). Effects of a 3 months therapy were quantified in terms of variations in body fat composition, Hematochemical parameters including lipid profile, HbA1c % and plasma antioxidant defences. Moreover in peripheral blood leukocyte through flowcytometric techniques it was possible to evaluate oxidative stress and oxidative damage parameters.

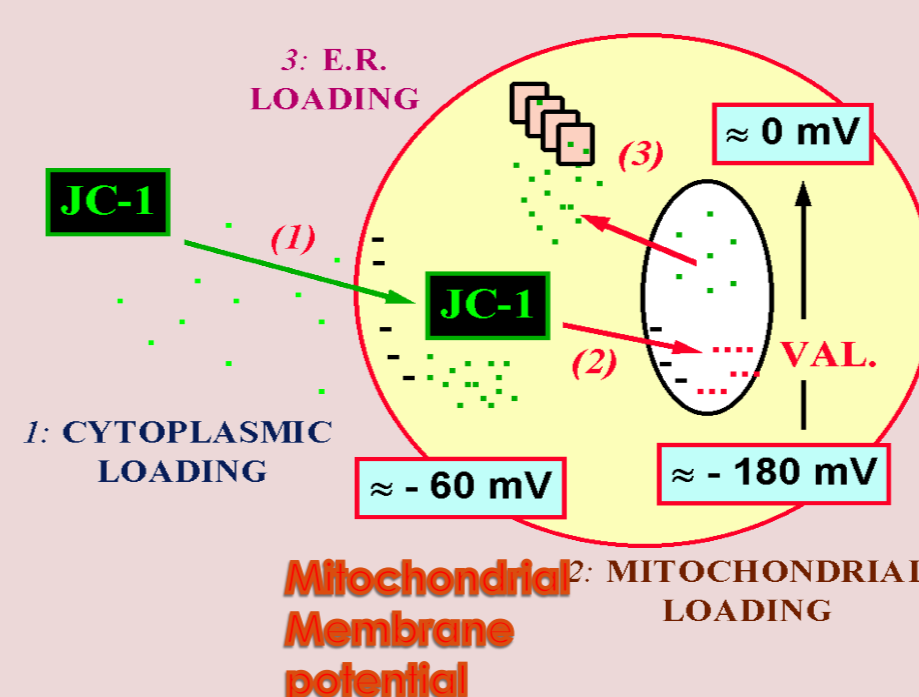
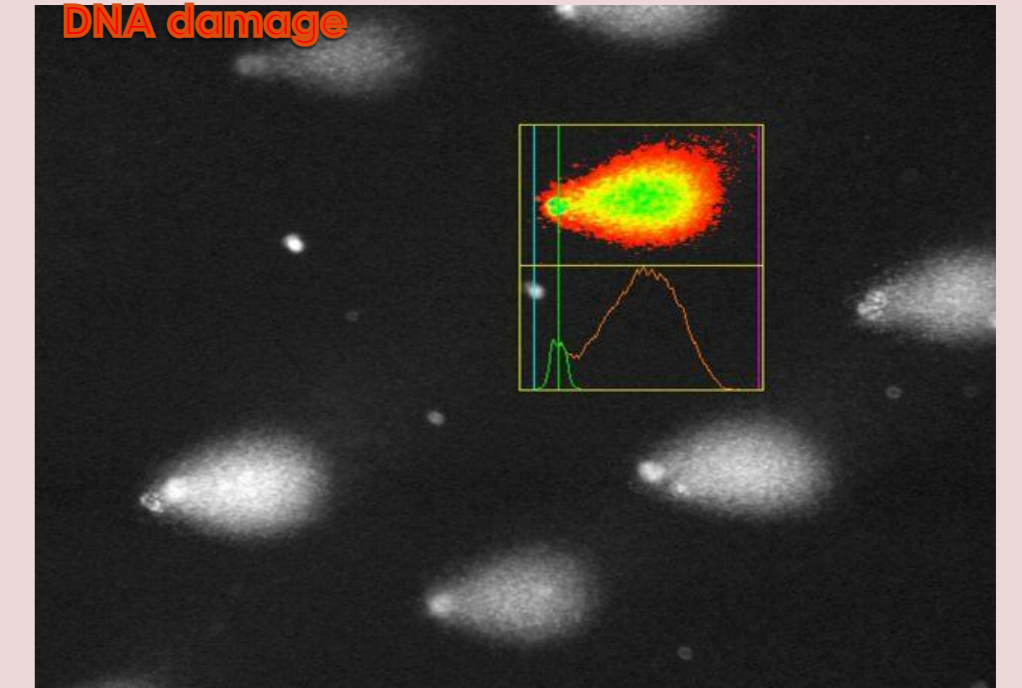
## Results & Discussion

Results show that, through the use of monitoring devices, patients had a significantly higher level of DTL, associated to a significant decrease of the ratio abdominal fat/total fat, plasma glucose, HbA1c. Physical exercise was associated with an improvement of plasma antioxidant defences (HDL-paroxonase) and oxidative parameters in lymphocytes (decreased ROS levels, increased mitochondrial functionality). These biochemical changes underlie important functional improvements at vascular levels as highlighted by a strong correlation between MOVE and Augmentation index. The present study confirms the beneficial effect of a mild physical activity in the management of diabetes and stresses the relevance of methodologies to enable a personalized feedback at patient level on their daily training routine.

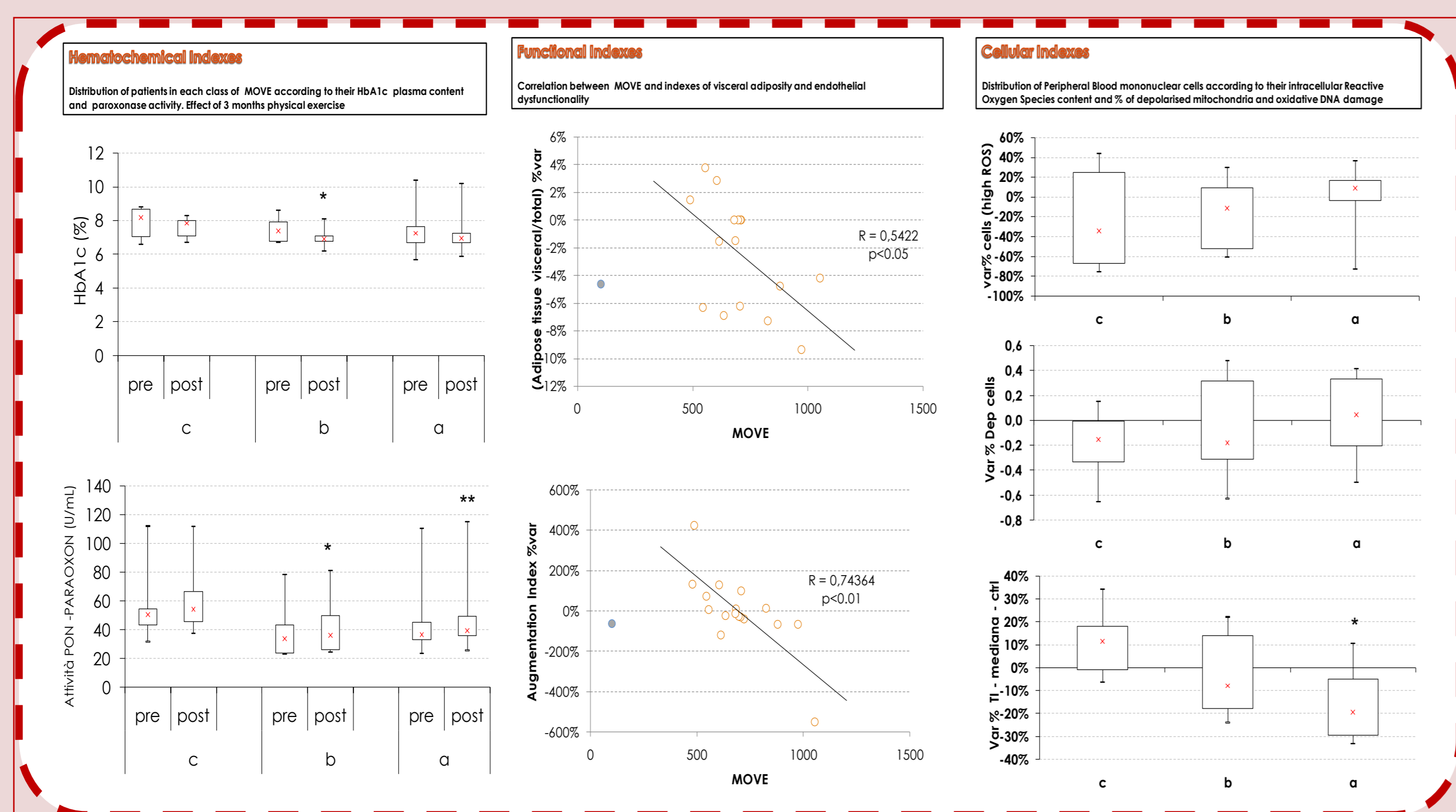
### ROS formation



### DNA damage



DEXA



## Methodologies and biochemical approaches

Oxidative stress parameters at cellular level were monitored through the use of reduced fluorescent probes (DCFH2-DA) exploited as reported of intracellular ROS levels while mitochondrial functionality was measured through the use of nerstian probes that accumulate actively into charged membranes and exhibit a shift in fluorescence in relation to their concentration. Anlysis of the signal was performed at single cell level through flowcytometric approach. Oxidative DNA damage was measured in isolated lypmphocytes using the alkaline version of the single cell gel-electrophoresis assay (Comet assay).



Di chi sara' il mondo di domani?  
Di chi oggi canta in coro.

17 GIUGNO 2015  
IL Di.S.C.O. SI RACCONTA