Low Body Mass Index (BMI) in ART naïve HIV-positive subjects and risk of virologic failure and drug discontinuation: data from the ICONA Foundation cohort.

Roberto Rossotti1, Giovanni Guiraldi2, Alessandro Cozzi Lepri3, Vincenzo Spagnuolo4, Stefania Cicalin5, Jacopo Vecchietti6, Eugenia Quirios Roldan7, Giordano Madder8, Sergio Lo Caputo7, Andrea Antinori9, Massimo Pugli10, Antonella d’Arminio Montorfano10 on behalf of the ICONA Foundation Study Group.


BACKGROUND

• In recent published literature, a low Body Mass Index (BMI) condition, defined as a value <18.5, is mostly evaluated in low/middle-income settings while in Western countries it was frequently evaluated in the pre- or early antiretroviral treatment (ART) setting.

• Nevertheless, in recent years BMI and weight gain returned to be investigational issues especially for the observed excessive weight increase under integrase strand transfer inhibitors (INSTI) treatment, especially with dolutegravir (DTG) and raltegravir (RAL) use.

• A BMI <18.5 cumulatively affects about 5% of HIV-infected population and might be related not only to complex clinical conditions but also to socio-economic issues.

• A BMI >18.5 is associated with an increased risk of death for both cardiovascular and neoplastic disease (with an OR 2.47 for males and 1.60 for females).

• An excessive weight gain in the first year of treatment has a strong impact on the development of cardiovascular disease and diabetes.

• However, a low BMI at baseline could have different meaning and diverse consequences compared to a persisting low BMI after ART start; additionally, few data are available on BMI normalization (expression of general conditions improvement) in terms of virologic and immunologic recovery, especially with the availability of modern ART drugs.

AIMS

• Aims of present Study are:
  - Define the proportion of subjects who start any ART with a low BMI<18.5.
  - Describe their demographic, clinical, and socio-economic evaluation.

• Evaluate the proportion of subjects who increase their weight to reach normal, overweight, or obesity condition within 48 weeks after ART start.

• Assess the consequences in terms of virologic and immunologic recovery, virologic failure, treatment switch, overall survival and clinical events (either AIDS or non-AIDS related) after BMI increase.

STUDY DESIGN AND METHODS

STUDY POPULATION

• ICONA Foundation Cohort is an observational study that enrolls HIV positive subjects naïve to antiretroviral treatment from more than 50 Centers operating throughout Italy. Since 1997, more than 16,500 individuals have been included in the ICONA Study.

• Subjects enrolled in ICONA from 2008 to 2018 with a BMI value available before ART start and a further assessment after 48 weeks of treatments were included in the analysis.

• Demographic, clinical, socio-economic and behavioral features were collected;
  - Study population was grouped according to the WHO classification of weight status;
  - BMI below 18.5: underweight;
  - BMI between 18.5 and 25: normal weight;
  - BMI between 25 and 30: overweight;
  - BMI above 30: obesity.

STATISTICAL ANALYSIS

• Descriptive statistics and non-parametric (Chi-square and Kruskal-Wallis) tests were used.

• KM probability curves and multivariable Cox regression models for virologic failure, treatment discontinuation and clinical events were used.

• Mean changes in CD4 and CD8 cell count from fitting a linear mixed model after ART start were estimated.

RESULTS (1)

• 8,556 subjects were included: 6,858 (80.2%) males, mainly born in Italy (6,451, 74.2%) and with comparable distribution among M (3,910, 46.7%) and females (3,646, 43.3%).

• Baseline BMI value was missing in 2,635 individuals (30.8%), for the stratification for the others was:
  - Underweight <18.5 (38.3%);
  - Normal weight: 3,926 (45.8%);
  - Overweight: 1,374 (16.1%);
  - Obesity: 437 (5.2%);

• The majority received FTC/TDF or TAF as backbone (81.3%), while the most prescribed three class rilpivirine (15.5%) and DTG (14.4%).

• After 48 weeks of treatment, among those starting from a low BMI 21.9% remained within the Underweight group, 30.5% entered the Normal weight, 1.9% passed in the Overweight/Obes (of note, 45.7% had no BMI value in the 48 week period).

• Underweight in an uncommon condition in ART naïve subjects would worsen virologic and immunologic conditions, as well as socio-economic issues (younger patients, especially female and not born in Italy, mostly intravenous drug users and smokers, with lower education and more migration employment state). Hence, low BMI might be a manifestation of advanced disease but also of social marginalisation.

• After 48 weeks of treatment only a minority failed to improve the BMI although a large proportion on enrolled subjects was missing the observation at this time point.

• A low BMI is related to virologic failure and treatment discontinuation, although age and sex were ART CD4 count played the pivotal role. Overall, it does not seem to have a role for the development of AIDS and serious non-AIDS clinical events. CD4 and CD8 count ratio were not influenced by baseline BMI, while CD4 decreased more in Underweight and Obese, thus reflecting an inflammatory reduction mainly evident in the two extreme classes.

• Nevertheless, low baseline BMI could be an indicator of vulnerability and might be considered as a predictor of treatment failure.

CONCLUSIONS

REFERENCES

ACKNOWLEDGMENTS: ICONA Foundation Study Group

FUNDING

ICONA Foundation is supported by unrestricted grants from Gilead Sciences, Janssen, MSD and ViiV Healthcare. This study has been supported by an unrestricted Medical Grant from Gilead Sciences.

Contact Information