INTRODUCTION: Smoking is negatively associated with infertility, both in men and women. There are a number of mechanisms involved, many of them controversial and not fully understood. On the other hand, some evidence has shown a pivotal role of reactive oxygen species (ROS) in sperm dysfunction and male infertility. Several studies have suggested an impact of seminal plasma antioxidant deficiency on altered semen parameters, but up to now, the results are controversial. The objective of the present study is to relate total antioxidant activity (TAA) of seminal plasma to tobacco consumption and classical sperm parameters.

MATERIAL AND METHODS:
Prospective study. Seminal samples were obtained from 140 consecutive males from infertile couples subjected to IVF/ICSI at the Human Reproduction Unit of Cruces Hospital, during a 4 month period. TAA and sperm analysis were performed blindly. All semen samples were analyzed according to WHO criteria (2010). The seminal plasma TAA was measured by the 2, 2’azino-bis (3-ethylbenzthiazoline-6-sulfonic acid) (ABTS) decolourization method. Smoking habits were assessed through clinical interview.

RESULTS:
There was no correlation between seminal plasma TAA and the classical sperm parameters: volume, concentration, progressive motility, total motility and morphology. Moreover, TAA was almost the same in samples assessed as normal and abnormal by 2010 WHO criteria. However, a significant decrease of seminal plasma TAA in heavy smokers group (>= 15 cigarettes/day) compared with non-smokers was identified (p=0.016). In addition, a significant negative correlation between seminal plasma TAA and the number of cigarettes per day (r=-0.486, P=0.01) was observed.

CONCLUSION:
Our study shows that smoking has a detrimental effect on sperm quality that is not manifested in conventional sperm parameters. More studies are needed to ascertain its relationship with fertility and the reproductive benefits of reduced smoking and/or antioxidant therapy in smokers.

LIMITATIONS, REASONS FOR CAUTION:
This study did not involve proven fertile subjects; the results are limited to a population of patients from infertile couples with either male or female factor infertility.

KEYWORDS: total antioxidant activity, semen quality, smoker, male infertility