CURRENT SMOKING IS ASSOCIATED WITH LOWER EJACULATE AND SEMINAL VESICLES VOLUME BUT HIGHER TESTOSTERONE COMPARED TO NO-SMOKING IN MALES OF INFERTILE COUPLES

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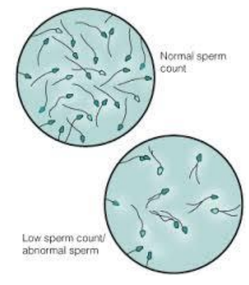
Introduction. Smoking habit has always been considered to exert a detrimental effect on male reproductive health.
However, several studies do not clearly demonstrate a negative effect of smoke on semen parameters.
In addition, the effect of smoke on male genital tract has been poorly studied by ultrasound (US).

Aim. To systematically evaluate possible correlations of smoking with clinical, biochemical, seminal and male genital tract US parameters in males of infertile couples.

Methods: A consecutive series of 426 men was systematically evaluated.
All men underwent, during the same day, an evaluation of:
-clinical characteristics,
-biochemical parameters
-scrotal and transrectal colour-Doppler-ultrasound (CDUS), before and after ejaculation,
-semen parameters, including semen interleukin 8 levels (sIL-8)



Results:
Among 426 men, 394 (36.0±8.0 years) without genetic abnormalities were studied.
229 were never-smokers (NS), 56 past-smokers(PS), 109 current-smokers(CS).
PS were older compared to NS and CS. (39.7±10.6, 35.9±7.6 and 36.4±7.0, respectively; all $p < 0.05$)
CS showed a significantly higher prevalence of alcohol and substance abuse, and lower frequency of physical activity.

CS showed higher total testosterone (TT) and lower FSH compared to NS or PS. (Fig. 1, panels A-C)

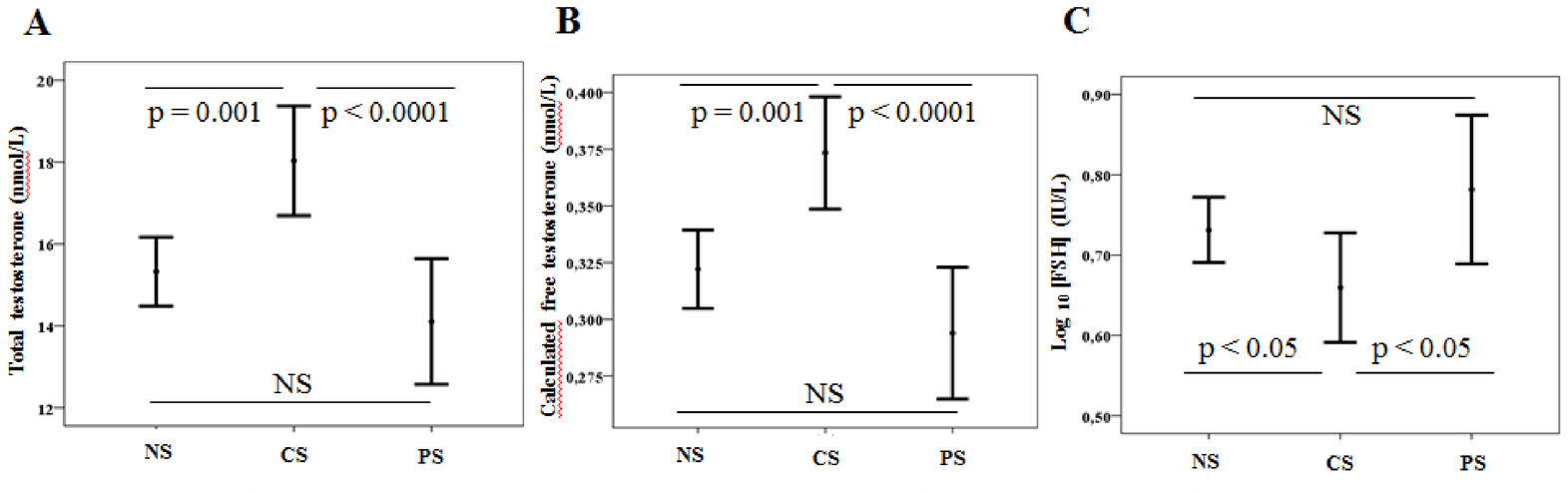
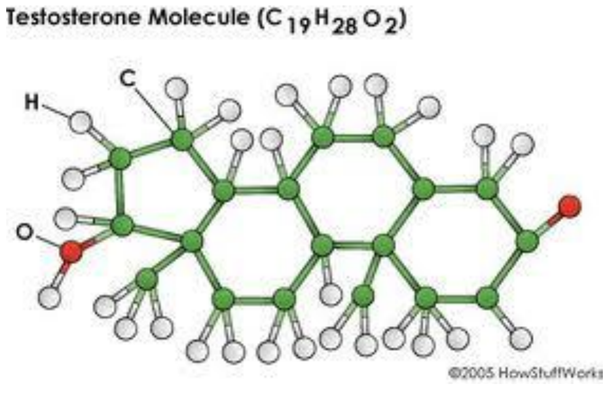


Fig.1



CS had significantly higher normal sperm morphology and sIL-8 levels, and lower semen volume compared to NS. (Fig. 2, panels A-C)

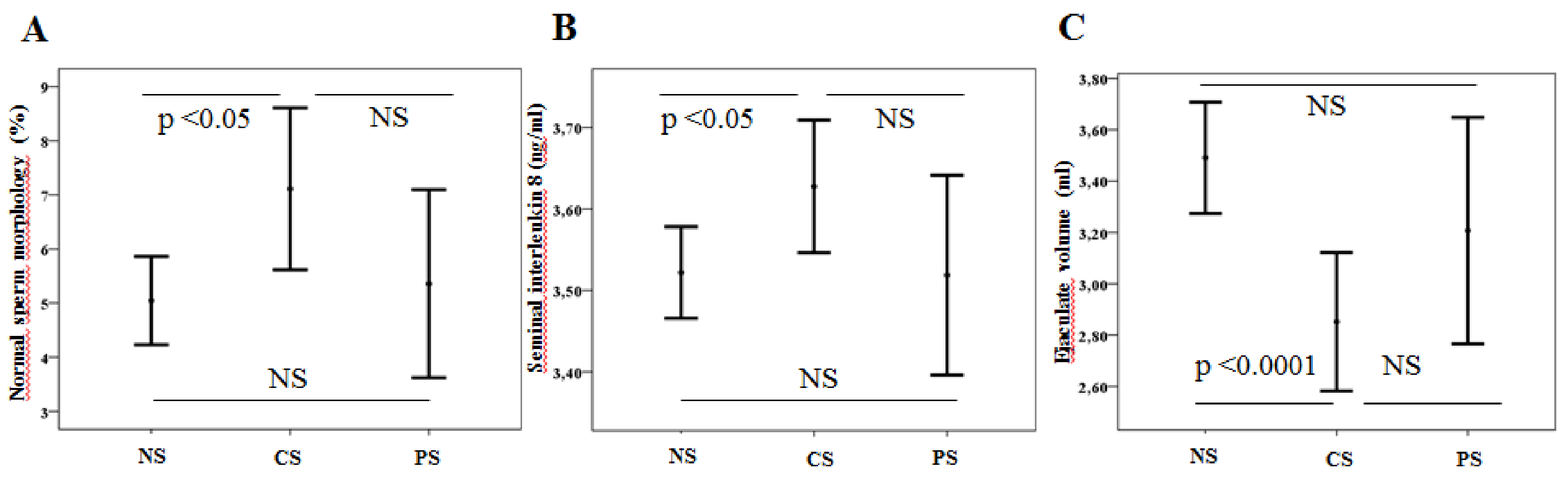


Fig.2

At CDUS, CS showed a lower seminal vesicles (SV) volume before and after ejaculation (Fig. 3, panels A and B) and a higher prevalence of dilated ejaculatory ducts (Fig. 3, panel C) compared to NS.

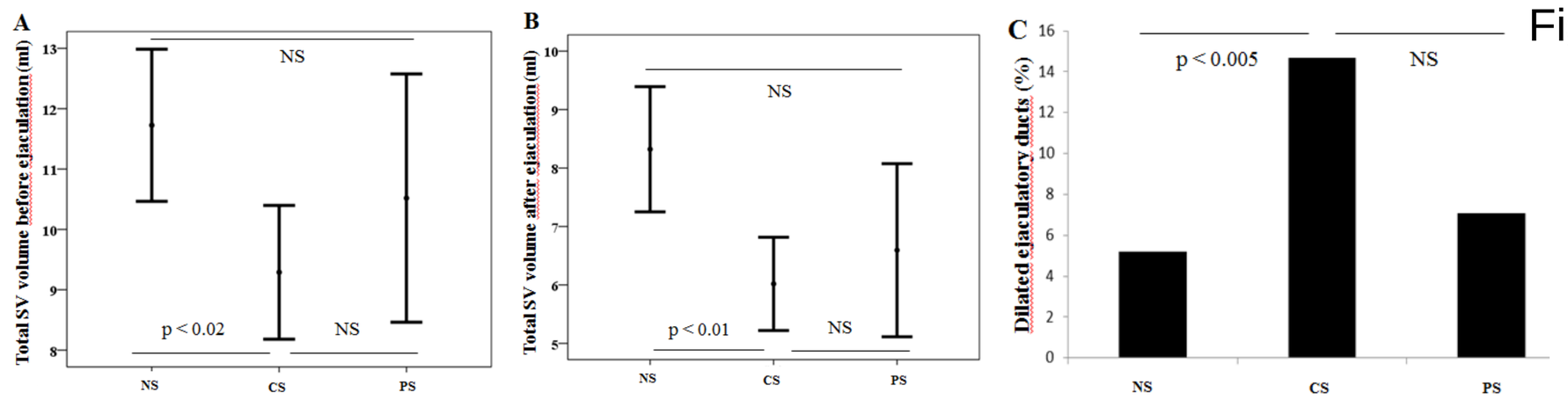
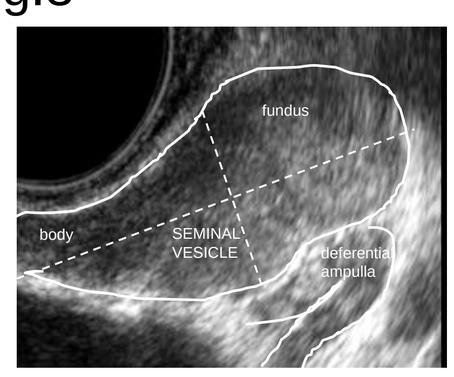


Fig.3



A further statistical analysis tested the previous significant associations by comparing CS (n=109) and no-smokers (n=285) adjusting for age, alcohol and substance abuse, physical activity, TT and BMI.
After adjusting for confounders, CS showed higher risk for higher T levels, lower FSH, lower semen volume and SV volume before and after ejaculation, and higher risk for dilated ejaculatory ducts (Table)
Other associations were not confirmed.

Conclusions. In males of infertile couples CS is associated with higher T levels, lower semen and SV volume and ejaculatory ducts dilation.
CS may lead to lower semen volume by modulating SV volume, despite higher T levels, compared to no-smokers, or promoting distal subobstruction.

	Multivariate analysis
Clinical parameters	
Duration of infertility (months)	AdjOR: 1.002 [0.985-1.018], p=0.848
Prostatitis-like symptoms	**AdjOR: 0.236 [0.063-0.880], p=0.031**
IPSS total score	AdjOR: 1.000 [0.944-1.060], p=0.993
Laboratory parameters	
FSH (IU/L)	**AdjOR: 0.41 [0.16-1.00], p=0.05**
Total testosterone (nmol/L)	**AdjOR: 1.059 [1.014-1.105], p=0.010**
Calculated free testosterone (nmol/L)	**AdjOR: 47.691 [3.440-661.180], p=0.004**
Triglycerides (mmol/L)	AdjOR: 1.003 [0.999-1.007], p=0.127
Seminal parameters	
Semen volume (ml)	**AdjOR: 0.819 [0.683-0.981], p=0.031**
Sperm morphology, % normal forms	AdjOR: 1.041 [0.991-1.092], p=0.099
sIL-8 (ng/ml)	AdjOR: 1.756 [0.894-3.449], p=0.102
Color-Doppler ultrasound parameters	
Prostate calcifications	AdjOR: 1.047 [0.592-1.853], p=0.874
Dilated ejaculatory ducts	**AdjOR: 3.009 [1.260-7.186], p=0.013**
Total SV volume before ejaculation (ml)	**AdjOR: 0.354 [0.141-0.890], p=0.027**
Total SV volume after ejaculation (ml)	**AdjOR: 0.311 [0.132-0.734], p=0.008**

Table 3. Multivariate associations between smoking habit and clinical, laboratory, seminal and color-Doppler ultrasound parameters. Smoking habit is considered as a dummy variable (no-smoker/current smoker). Multivariate analysis has been performed using a binary logistic model, adjusting for age, body mass index, current alcohol consumption (no/yes), current dope consumption (no/yes), physical activity (no/yes) and total testosterone. FSH, follicle stimulating hormone; sIL-8, seminal interleukin 8 levels; SV, seminal vesicles.