

Pathological Gambling in Parkinson's disease patients: dopaminergic medication or personality traits fault?

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ABSTRACT

- Introduction:** Impulse control disorders (ICDs) are common and clinically relevant in Parkinson disease (PD) patients, with a well established association with PD medication. However, previous studies demonstrated that ICDs are equally common in newly diagnosed, untreated PD patients and in normal population (approximately 20%).
- Objective:** aim of our study was to detect whether the increase frequency of ICDs reported in PD patients compared to normal controls is attributable exclusively to dopaminergic medications, to personality traits or to an interaction of both these two aspects.
- Subjects and Methods:** 40 Patients affected by PD according with Brain Bank Criteria were included in our study. None of them was affected by cognitive decline. Twenty patients of the studied group have had an history of pathological gambling (PG) developed after PD onset, during dopaminergic medication. The remaining 20 PD patients on the contrary had never experienced PG according to them and their caregivers reports. The two groups (PG-PD and Non PG-PD) were matched for sex, age and disease duration and severity. All subjects were tested with the Minnesota Multiphasic Inventory Personality scales (MMPI-2) that have expected high sensitivity to apparent addictive behaviors.
- Results:** our data analyzed by comparing the two groups across the numerous variables of the MMPI (Mann Whitney test) demonstrated a significant difference in PG-PD vs non PG-PD concerning depression, anxiety, social introversion and difficulty, limited compliance to rules, with an higher lying frequency ($p > 0.001$).
- Conclusions:** accordingly with our results PG as part of ICDs seems to be secondary not only to dopaminergic medications but also to precise personality traits. MMPI-2 may be an useful test for PD to be utilized before adding dopaminergic treatment, able to detect eventual personality traits responsible for subsequent ICDs appearance.
- References:-** Weintraub D, Papay K, Siderowf A. Neurology 2013;January 8; 176-180; - Farnikova K, Obereignereu R, Kanovsky P, Prasko J. Cogn Behav Neurol 2012, 25;1; 25-33

INTRODUCTION

• Impulse Control Disorders (ICDs) including compulsive gambling, buying, sexual behavior and eating show larger incidence in Parkinson's disease population in comparison to normal subjects, with a well established association with PD drugs.

• Previous studies demonstrated that ICDs are equally common in newly diagnosed, untreated PD patients and in normal population (approximately 20%). This finding supports the hypothesis that ICD develop because of antiparkinsonian drug use but do not rule out the hypothesis that specific personality characteristic, interacting with drug use, may be necessary in order to develop ICD.

Moreover, psychiatric patients with substance addiction or impulse control disorders present specific personality characteristics that differ from control subjects, thus is plausible to hypothesize that specific personality aspects, different from normal PD population, may support ICD development in some PD pts but not in the all population, although treated with the same dopaminergic medications.

AIM OF OUR STUDY WAS

to evaluate personality traits by means of Minnesota Multiphasic Personality Inventory-2 (MMPI-2) of a population of PD pts affected by Pathological gambling in comparison with a group of PD pts, matched for clinical, pharmacological history and demographic characteristics, not affected by impulse control disorders.

SUBJECTS

Fifty-eight 58 patients affected by idiopathic PD according with the Brain Bank Criteria were enrolled for the present study.

- ✓ **Thirty-seven 37 of them had a personal history of Pathological gambling (PG)** resolved at the time of the inclusion from at least six months, by changing dopaminergic medications.
- ✓ **The remaining 21 PD patients had never experienced ICDs (no PG)** as personally stated or as reported by caregivers although they were matched for dopaminergic therapy history.

Inclusion criteria were: adequate educational level (> 8 yrs of scholarization); no history of dementia (MMSE $>28/30$); stable dopaminergic medications for at least six months before evaluation, no use of antidepressant or antipsychotic medications.

DISCUSSION

According with our results patients affected by PD with pathological gambling seem to present specific personality characteristics. We found a significant difference between PG and non PG PD groups concerning content scales, with in particular a significant difference in cynicism and bizarre ideation. On the basis of the reported characteristics PG PD may be described as diffident persons with negative behavior towards others although with close relationship; moreover, PG PD seems to have strange thoughts and ideas on paranoid side.

It's interesting to note that, across the 20 PD patients with a personal history of PG, we found significantly ($p = 0.02$) higher value of K scale however without pathological mean value, supporting a defensive behavior towards the test and the simulation of a good adaptation.

In the same direction we found that PG PD differ from Non PG group for a significant trend to lie. This tendency, led to exclude from principal analysis 17 out of 37 PD patients, reporting pathological value at the validity scales (K,L,F) while, the contrary, only 2 out of 21 patients were excluded for the same reasons from the non PG group.

METHODS AND STATISTICAL ANALYSIS

All subjects were asked to fill the MMPI-2 questionnaire.

It is one of the most commonly used assessment tools in mental health to evaluate personality characteristics, consisting in 567 true/false questions that assess a broad range of self reported psychopathology. It consists of three validity scales 10 clinical scales with the related sub-scales, and 14 content scales. All pts were tested in the morning under their usual dopaminergic drugs in on state.

In general, standard scores on all the scales in the range from 45-55 are within normal limits and indicate that the individual shows an effective emotionality and responds to stress without crippling neurotic defenses or psychotic decompensation. As the standard scores increase and approach 70 and above, the individual is usually found to have an emotional disorder. The nature of the disorder is predicted by the profile or pattern of the elevated scores.

Results obtained by MMPI-2 for the two PD groups (PD with PG and PD without PG), were compared by Mann Withney test. Bonferoni correction was applied.

RESULTS 1

Among the 37 PD with Gambling, 17 were excluded from principal analysis because of the three validity scales score, demonstrating they were lying.

Moreover, **the remaining 20 PD patients with a personal history of PG, showed a significantly ($p = 0.02$) higher value K scale** (one of the validity scales), although pathological mean values were not observed in non of the three validity scales.

Concerning the clinical scales no significant differences were obtained between the two groups when comparing the different variables. However, pathological values were obtained by the PG-PD group at the Depression scale (65.9 ± 9.4), and by the Non PG group at the hypocondria scale (68.1 ± 10.5).

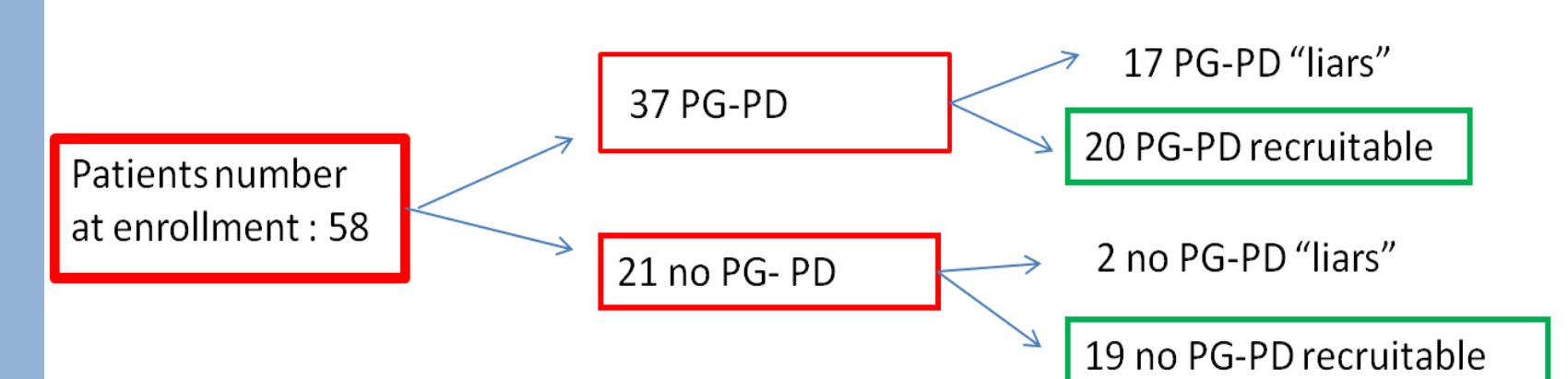
Concerning the content scales a significant difference between the two groups was observed concerning anxiety scale ($p = 0.04$), bizarre ideation scale ($p = 0.02$), cynicism scale ($p = 0.02$), social discomfort scale ($p = 0.005$). However after Bonferoni correction only cynicism and bizarre ideation remained significantly different between the two groups. Moreover, a trend to differ, although not significantly was reported at the scale for depression ($p = 0.06$). Notably, no pathological scores were reached by the two groups.

RESULTS 2

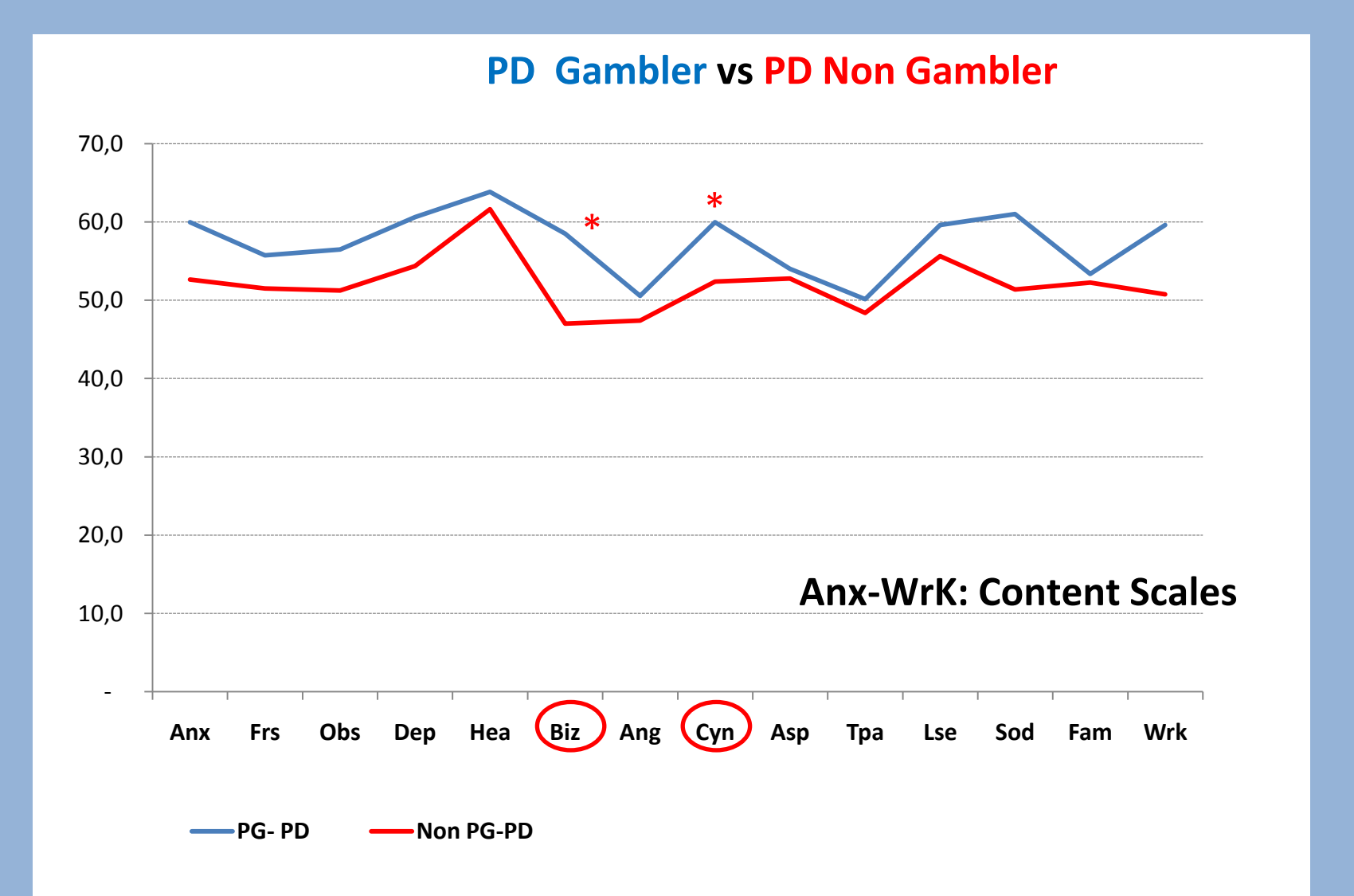
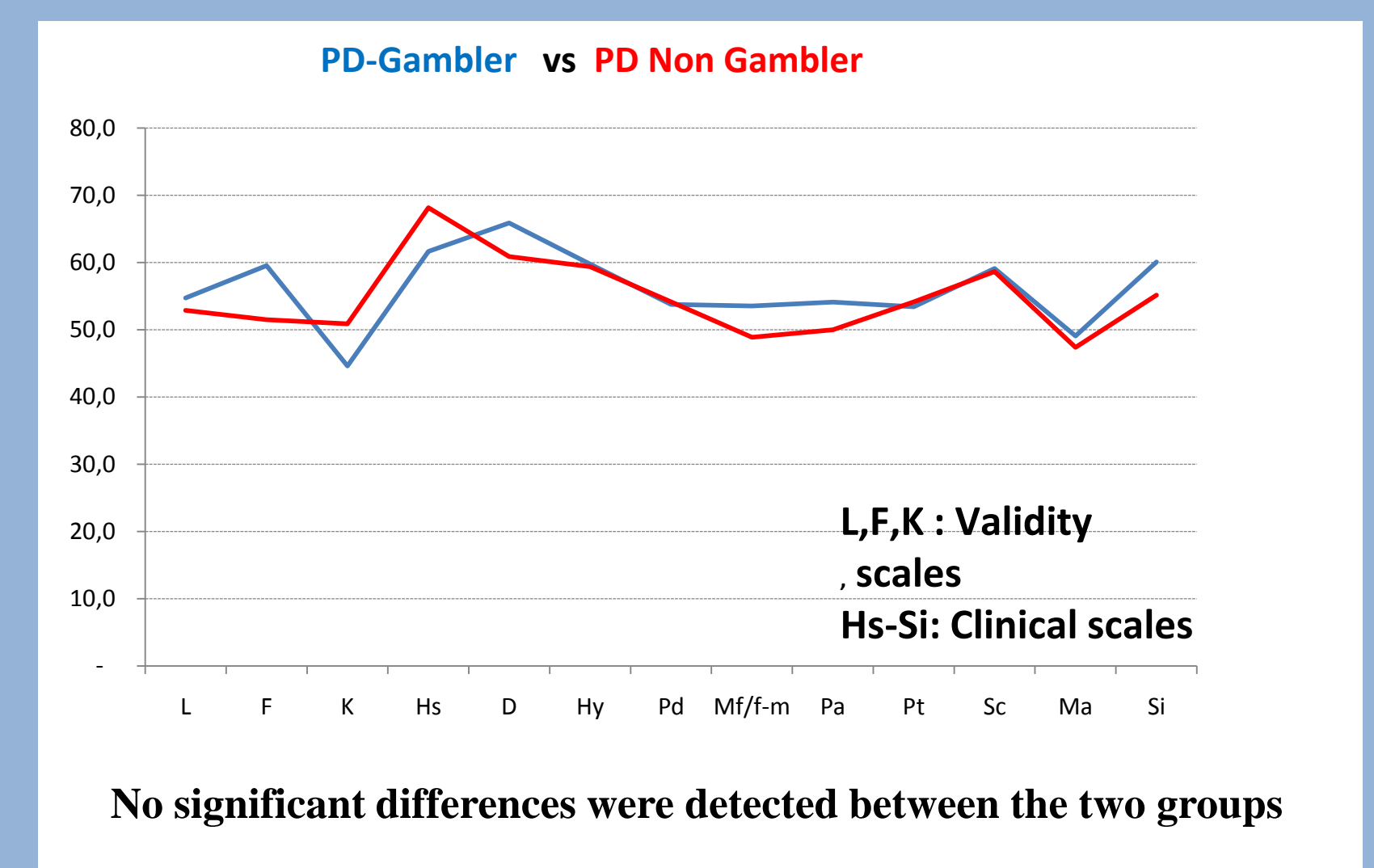
Re-analyzing results obtained in the 17 PD with PG

we initially didn't considered because " liars", when comparing their profiles with no PG PD, we observe no significant differences concerning clinical scales, while, across content scales they differ regarding bizarre ideation ($p = 0.001$), cynicism ($p = 0.001$), social discomfort ($p = 0.01$) anxiety ($p = 0.0001$), depression ($p = 0.001$) fear ($p = 0.01$) and obsession ($p = 0.0001$) as PG not liar PD differ from non PG PD.

Patients clinical characteristics



	PG - PD	Non PG PD
Pts number	20	19
Gender (m/f)	11/9	10/9
Mean age (yrs)	68 ± 5.3	67 ± 4.1
Mean Disease Duration (yrs)	6.5 ± 3.2	6.3 ± 1.4
L-dopa equivalent daily dose at evaluation (mg)	480 ± 125	525 ± 100
Mean UPDRS section III in on state at evaluation	19 ± 2	22 ± 3



CONCLUSION

In conclusion, our findings support the hypothesis that ICD develop not only because of antiparkinsonian drug use, but specific personality characteristic, interacting with drug use, may be necessary.

In particular personality profiles we identified as characteristic of PG PD remind cluster A personality disturbances -Axis 2 according with DSM-4 TR (paranoid type).

Moreover a relevant finding is that a large portion of gambling positive PD patients has a tendency to lie. An high score fo K index may be considered as a risk factor for developing gambling.

Thus, in the clinical practice may be useful test personality characteristics by means of MMPI before treating our PD patients with dopamine agonist, to detect in advance a possible tendency to develop ICDs, on the basis of specific personality traits.