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Short communication

Prevalence and cognitive underpinnings of isolated apathy in young healthy subjects

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ABSTRACT

Background: Apathy is well described in neurodegenerative conditions, however to date there is no evidence of significant isolated apathy in subjects free from other neurological and psychiatric comorbidites. Identifying isolated apathy in subjects free from neuropsychiatric conditions could contribute to refining current concepts of apathy and reevaluate its nosological classification as an independent clinical syndrome.
Methods: We assessed apathy and perceived quality of life in a group of 2751 adults (age 19–40 years) free from neuropsychiatric or medical conditions. Subjects with and without elevated apathy were compared on measures of depression, self-efficacy, behavioral inhibition, and behavioral activation.
Results: Observed prevalence of isolated elevated apathy was 1.45%. Subjects with apathy presented with reduced quality of life and lower behavioral activation compared to apathy-free subjects, while there was no difference between the two groups on measures of depression, self-efficacy, and perceived social skills.
Limitations: The main limitation of this study is the use of self-report questionnaires.
Conclusions: Isolated, ecologically-relevant apathy can be found in adults independently from the presence of subclinical depression or of concurrent medical conditions. Apathy screening should be considered in the evaluation of young non-depressed subjects with reduced perceived quality of life.

1. Introduction

Apathy represents a disorder of motivation characterized by a reduction of overt goal-directed behavior, goal-directed cognition, and emotional concomitants of goal directed behaviors (Marin, 1991). While significant apathy can be found in subjects affected by mood disorders (Marin et al., 1993; van Reekum et al., 2005), recent years have seen an increase in the interest of the clinical community for isolated apathy (IA), i.e. apathy in the absence of mood disorders. Indeed, IA has been recently described in different degenerative conditions such as Parkinson's Disease (Starkstein et al., 1992; den Brok et al., 2015; Pagonabarraga et al., 2015), Alzheimer's Disease (Robert et al., 2002; Starkstein et al., 2006; Rosenberg et al., 2013), or cerebrovascular disorders (Starkstein et al., 1993), thus suggesting the clinical and epidemiological relevance of IA, especially in neuropsychiatry (Marin, 1991).

One of the key problems in our current models of IA is its

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validity as a distinct clinical syndrome (Starkstein and Leentjens, 2008). Indeed, while it has been proposed that IA should be considered as an independent clinical entity (Marin, 1991), the position of IA in current nosology remains poorly defined, mainly due to the lack of convincing evidence of the presence of IA in subjects free from neurological conditions.

We decided to evaluate the prevalence of IA in a large cohort of healthy adults free from neurological and psychiatric conditions. To reach a better characterization of apathy and to shed light on its cognitive correlates, we also decided to evaluate the ecological impact of IA on quality of life, as well as its relationship with widely-used constructs such as reward dependence, social skills self-perception and self-efficacy.

2. Methods

2.1. Subjects' enrollment and evaluation

Subjects' enrollment was conducted in two separate phases. In the first phase, we determined the prevalence of apathy in otherwise healthy adults by sending out the following questionnaires: Apathy Evaluation Scale, Self Report Scale (AES-S) (Marin et al., 1991), Zung Self-Rating Depression Scale (Zung SDS) (Zung, 1965), Standardized Assessment of Personality Scale (self-report abbreviated version) (SAPAS) (Moran et al., 2003), Visual Analog Scale of Quality of Life (VAS QoL) (0-100 with higher scores representing higher perceived QoL), Krupp Fatigue Severity Scale (FSS) (Krupp et al., 1989), and a validated autobiographical questionnaire, based on the Italian Cognitive Behavioral Assessment battery (Sanavio et al., 1986), to screen for the current or previous use of psychoactive drugs, current or previous diagnosis of mental or neurological disorders, and the prevalence of depressive disorders in the subject's family. All tests are described in Table 1.

The recruitment for phase I was performed as follows: over a 24 month period 5620 subjects (19–40 years old) with at least 13 years of formal education and were enrolled through advertisement in Universities, non-profit associations, sports clubs and religious groups. More in detail, 3200 subjects were enrolled in the first year and 2420 subjects in the second year of the study. Regarding the enrollment procedure, 4440 subjects were recruited in University campuses (including pre-doctoral students, doctoral students, university staff and their friends and relatives), while the remaining subjects were recruited in non-profit associations and other special interests groups.

Out of the 5620 subjects, 3305 (58.8%) returned their questionnaires. We retained as significant for our study those subjects presenting with a: (i) a Zung SDS score lower than 50 (i.e., suggestive for the absence of significant depressive levels) (Zung, 1965); (ii) a SAPAS score lower than 3 (i.e., negative screening for personality disorders) (Moran et al., 2003); (iii) a lack of reported psychoactive drug use and of current or previous mental or neurological disorders based on the autobiographical questionnaire; and (iv) a mean FSS score lower than 5.2 (i.e., lack of clinically relevant fatigue levels) (Krupp et al., 1989). Finally, we retained 2751 questionnaires (48.9% of the enrolled population). This group was composed by 1620 university students (including pre-doctoral and post-doctoral students) and 1131 individuals currently working full-time (250 of them described themselves as self-employed). Income data were not available and subjects were not compensated for their participation in the study. All subjects described themselves as Caucasians.

In the second phase of the study, those subjects identified in phase one and presenting with an AES score higher than 34 points, a cut-off used to identify significant apathy in this age group (Kant et al., 1998), were included in the Apathy group. Moreover, all subjects presenting with the lowest possible AES score (i.e. 18 points) were included in the Control group. The two groups underwent medical and neurological examinations and a psychiatric evaluation based on the Structured Clinical Interview for DSM-IV-TR Axis I Disorders (First et al., 2002) and on the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (First et al., 1997). Medical and neurological examinations and as thyroid stimulating hormone essays were normal for all subjects included in the Apathy and Control groups. Two independent psychiatrists evaluated all the subjects included in these groups ensure a lack of psychopathology. Based on the inclusion and exclusion criteria described above the Apathy group was composed by 40 subjects and the Control group by 73 subjects

At the time of the clinical evaluation, subjects of both groups were asked to fill-out the following questionnaires: SAPAS, Zung SDS, FSS, QoL VAS scales, as well as several new questionnaires, including the Behavioral Inhibition and Behavioral Activation Scales (BIS/BAS) (Carver and White, 1994), Sherer's general self-efficacy scale (GSE) (Sherer et al., 1982), and a 0–100 VAS of self-perceived social skills (all scales are described in Table 1). Moreover all subjects were evaluated with the Clinician-administered version of the AES (AES-C); given the better psychometric properties of the AES-C we used this version of the scale as the main apathy measure of the study (Marin et al., 1991). All raters

Table 1
Description of the scales used in the study.

Scale	Description
AES	The AES is an 18-item scale developed to quantify the intensity of apathy in different neuropsychiatric conditions. Each item is scored on a 4-point Likert scale with higher scores representing more severe apathy.
Zung SDS	The Zung SDS is a self-report questionnaire assessing depressive levels in the general population. Scores lower than 50 are thought to represent the lack of significant depressive symptoms
SAPAS	The SAPAS is a screen for personality disorders composed of eight dichotomously rated items; a score of three of more is thought to correctly identify a significant majority of clinically relevant personality disorders
QoL VAS	In this visual analog scale rated from 0 to 100, higher values represent higher perceived QoL
FSS	The FSS is a self-report measure of fatigue (9 items) using a 7-point Likert scale (1=no fatigue-related impairment, 7=severe impairment)
BIS/BAS	The BIS/BAS questionnaire has been developed to probe the behavioral inhibition and behavioral activation systems. The behavioral inhibition system is thought to suppress behavior that is expected to lead to punishment while the behavioral activation system is thought to mediate sensitivity to potential rewards and to initiate behaviors that bring the subjects closer to biological reinforces. It is composed of 24 items. Each item is scored from 1 to 4; it can be divided in a scale probing the BIS and three scales probing the BAS (drive, fun seeking and reward responsiveness)
General self efficacy	The GSE is a Likert format 17-item scale in which each item is scored from 1 to 5 and aims to assess self-efficacy, which represents the belief in one's capabilities to meet environmental demands. Higher scores represent higher self-efficacy perception.
Perceived social skills VAS	In this visual analog scale rated from 0 to 100, higher values represent higher perceived social skills.

AES: Apathy Evaluation Scale; SDS: Self-Rating Depression Scale; SAPAS: Standardized Assessment of Personality Scale; VAS QoL: Visual Analog Scale of Quality of Life; FSS: Fatigue Severity Scale; BIS/BAS: Behavioral Inhibition and Behavioral Activation Scales.