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Intellectual deficiency and the duplication 24 bp of ARX gene in series of Moroccan patients

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Intellectual Deficiency (ID) is a general term for a neurological impairment, due to abnormalities of brain structure or function. Causal factors related with cognitive disability are multiples and can be classified as genetic, acquired (congenital and developmental), or environmental.

Mutations of the ARX gene constitute a major contributor to X-linked mental retardation (XLMR). They are associated with a broad spectrum of disorders, including nonsyndromic and syndromic X-linked ID. The 24bp duplication in the exon 2 of this gene lead to expansions of the polyalanine tracts. It is the most frequent mutation. Our research comprises 65 Moroccan patients with mild ID (Intellectual Quotient IQ 50-55 to 70) from «Attawassol center for mentally retarded» in Fez, engaged between October 2014 and January 2019. The main objective of this molecular, prospective and exploratory monocentric study was to determine the prevalence of ID, the symptoms and to screen for the 24 bp duplication mutation in males (37 patients) in our series living in Fez city and their regions. The results were processed and analyzed with Statistical Package for the Social Sciences (SPSS 24), and the mutation screening was performed by fragment size analysis of PCR (polymerase chain reaction) product of ARX exon 2, performed in the molecular genetics laboratory in Saint Etienne (France). The average age of patients was 17± 0, 98 years (6-31 years). Our results showed that the prevalence of ID was 71% in boys versus 29% in girls, and several symptoms of ID were observed in our patients. The 24 bp duplication of ARX was not identified in any of the male patients tested. The prevention of ID is obviously based on the genetic, the social, the toxic and the infectious causes.

Key words: *duplication 24BP, arx, nonsyndromic mental retardation, morocco, prevalence, symptoms*

Moroccan dyslexic students: Assessment of anxiety, depression and self-esteem

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Purpose of the study.- The objectives of this study were to: 1) to assess self-esteem, anxiety and depression in dyslexic Arabic-speaking children and adolescents, 2) to describe psychiatric comorbidities in these subjects by comparing them to their non-dyslexic peers. Patients and method.- 204 students (56 dyslexics and 149 good readers), pursuing their education in ordinary schools in the Beni Mellal-Khenifra region of Morocco, responded to Taylor's self-assessment scale of anxiety, the Beck's depression questionnaire, and the coopersmith self-esteem inventory (SEI). Results.- Overall, dyslexics are more anxious, more depressed and have a disturbed self-esteem compared to their "normal" peers. The percentage of psychiatric comorbidity is higher in the dyslexic group. Conclusion.- The results of this work highlight the need for a multidisciplinary approach that integrates emotional needs assessment into reeducational care of dyslexic children and adolescents

Key words: *self-esteem, anxiety, depression, dyslexic student*

Academic performance, anxiety, depression, self-esteem and reading acquisition level in children school-age Moroccans

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In this study, the association between the reading acquisition level, the anxiety and depressive symptoms and self-esteem status is examined in children and adolescents school-age. Then, the links between these problems and academic achievement were analyzed. A sample of 245 students (130 boys and 115 girls) aged 9 to 17 years (M= 11.5 years), pursuing their studies in ordinary institutions school in the Beni Mellal-Khenifra region of Morocco, voluntarily participated in this research. The subjects completed the measurements of three self-evaluative scales: the Beck Depression Inventory (BDI), the Coopeersmith Scale of Self Esteem (SEI) and the Taylor questionnaire of manifest Anxiety. The results confirm that emotional manifestations are more frequent in "weak readers" and those with intermediate reading skills by comparing them to good readers. Academic performance and reading level are negatively correlated with anxious-depressive symptoms and positively with self-esteem (the correlations are significant). In each reading level, the analysis of the results does not show any relevant difference, in terms of the psycho-pathological disorders intensity, between girls and boys. These data urge education and public health officials to adopt multidisciplinary strategies to confront learning difficulties and emotional problems in the school environment.

Key words: *reading acquisition, anxiety, depression, self-esteem , academic performance*

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Fungal metabolites with potential neurotoxic effects: Occurrence, risk and current legislation in foodstuffs from Morocco

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Mycotoxins are a group of chemical compounds produced mainly by Aspergillus, Penicillium, Alternaria and Fusarium species that could grow on foods and feeds. These fungal metabolites are known to be harmful toward human and animal health. Many mycotoxins are known to have the potential to induce neurotoxicity in rodent models. Indeed, OchratoxinA (OTA) causes acute depletion of striatal dopamine and its metabolites, accompanying evidence of neuronal cell apoptosis in the substantianigra, striatum and hippocampus. T-2 toxin induces neuronal cell apoptosis in the fetal and adult brain. Macrocyclictrichothecenes (Stachybotrys toxins) bring about neuronal cell apoptosis and inflammation in the olfactory epithelium and olfactory bulb. Fumonisin B1 induces neuronal degeneration in the cerebral cortex, concurrent with disruption of de novo ceramide synthesis.

In general, warmer temperatures and higher humidity promote mold growth during post-harvest period. Moreover, pathogenic molds are able to attack live plants and produce theses toxins in the field. In Morocco, several paper were published on the occurrence of mycotoxins in Food and feeds. This conference gives an overview on the presence, risk assessment of selected mycotoxin (aflatoxins, ochratoxin A, Fusarium toxins, Emerging toxins) in foodstuffs available on the Moroccan markets. Mycotoxins were found to contaminate more than of 50% of some investigated samples (raw cereals, infants cereals, bread, couscous, pasta, milk, spices, dried fruits, etc.) and the EU maximum residues limits (MRLs) were sometimes exceeded. Due to their toxicological effects on humans and animals, specific regulations was adopted worldwide to set MRLs (FDA, FAO/WHO, EU countries, etc.) and reduce risks for humans and animals health. Recently, new regulations were adopted by official authorities and published in the "Bulletin officiel" of The Kingdom of Morocco in 2016 to set some MRLs for selected mycotoxins such as: Aflatoxins, Ochratoxin A, Deoxynivalenol, Zeralenone and Fumonisins and Patulin.

Key words*: mycotoxin, toxic effects, occurrence, risk, legislation, morocco*

Assessment of memory skills in a group of school-aged children in the Beni mellal-khenifra region

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Memory is, first and foremost, the ability to store and retrieve acquired information. Memory disorders are multiple and cover both the disorders of the acquisition of a memory (encoding), the disorders of the maintenance of this memory in the long term (storage), and the disorders of the reuse of stored information (recovery). They can exist under a variety of circumstances in children and adolescents.

The Rey Complex Figure is a psychological test used in neuropsychology and evaluationo of the memory retention of complex information. The task of the RCF is to copy a complex geometric figure presented visually and then to reproduce it from memory. According to some authors (Shorr, Delis, Massman, 1992), the omissions in memory reproduction reveal a fragility of retrieval or encoding of information during the production of the copy.

The objective of this work is to study the cognitive processing involved in making the copy of the complex figure of Rey (study of the number of omissions) and to observe the degree of accuracy of the deferred production of the RCF.

60 children aged 6 to 16 years old from the Béni mellal-khenifra region passed the RCF test according to standard conditions. The productions were evaluated with the point rating system developed by Rey (1959).

The results of the study show signs of memory deficits in 23% of the children examined. Boys and girls perform equally, with no interaction with age. The majority of children in this group proceed step by step, unit by unit (fragmentary style) and not globally. There is a clear improvement with age and grade level and it is around the age of 9 that a more logical and global approach to the figure begins.

This study was exploratory and focused on a small number of children. Future research is needed to verify and extend these preliminary results.

Key words: *memory disorders, RCF, school children, béni mellal region*

The effect of attention-deficit/hyperactivity disorder (ADHD) on the executive functions of children between 6 and 12 years old

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Attention-deficit/hyperactivity disorder (ADHD) is one of the most frequent psychiatric conditions in childhood. It is caused by a combination of genetic and environmental factors, and symptoms vary within and between patients (Houmann et al., 2014). Prevalence of the disorder is approximately 5.3% worldwide and occurs mostly in boys (Schellack & Lecturer, 2017).ADHD is a neuro-developmental disorder that began to appear in childhood. Based on the Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM-5) ADHD symptom appears and shows impairment before age 12 years (Rahmi, Mada, Wimbarti, & Mada, 2018).

Children with ADHD have serious difficulties with executive functions in so many areas. the executive dysfunctions are found in children with ADHD including difficulties with priority and time management, planning and organization, initiating and completing tasks in a timely manner, difficulty shifting cognitive set, a high level of procrastination, forgetfulness and poor working memory (Hosenbocus & Chahal, 2012).

Most children with ADHD also present with one or more other comorbid conditions. Common co-morbidities that are associated with ADHD include learning disabilities, anxiety, depression, conduct disorder, oppositional defiant disorder, tics/Tourette's syndrome and substance abuse(Schellack & Lecturer, 2017).

ADHD should be treated with a comprehensive treatment plan that should include psychoeducation for the family and initial psychopharmacological treatment as approved by the Medicines Control Council.However, Pharmacological interventions seem to focus on the modifications in the dopaminergic and noradrenergic systems as the core of the symptoms(Schellack & Lecturer, 2017).

Key words: *attention-deficit/hyperactivity disorder (adhd), executive functions, children, comorbidities*

Effect of glyphosate on the immune and neuroendocrine systems of the Mytilus Galloprovincialis mussel

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In order to optimize the performance of farms, the use of pesticides has become an essential element in the usual agricultural practices. These plant protection products are toxic to humans and environment to varying degrees.

Glyphosates, herbicides, are widely used worldwide since 1970s, to eliminate weeds in urban green spaces, on industrial and wooded land, as well as on food crops. There is no doubt in the toxicity of these organophosphorus compounds, although the degree of this toxicity to different living organisms and the environment has raised many controversies and contributed to growing concern among some researchers.

It has been demonstrated that glyphosates inhibit growth-specific metabolic pathways in plants, however several studies have been conducted on the health and environmental risks associated with the use of these compounds. Conversely, some studies have not been able to establish a real risk, others have shown that glyphosates could be endocrine disruptors, carcinogens, genotoxic and neurotoxic agents.

For the same purpose, the present study aimed to investigate the effect of glyphosate on the immune and neuroendocrine systems of the mussel Mytilus Galloprovincialis as a biological model with a relatively simple immune system and a well-characterized nervous system in functional, cellular and molecular levels.

Key words: *pesticide, neurotoxic action, immune system, neuroendocrine system, mytilus galloprovincialis*

Implication of serotonin and dopamineneurotransmitter systems in the resistance to the osmoticstress induced by prolonged water deprivation in rat

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This study examined the effect of prolonged water deprivation, in rat, on 5-HT- and TH- immunoreactivity in Dorsal Raphe Nucleus (DRN), Substantia Nigra pars compacta (SNc), Ventral Tegmental Area (VTA) and Magnus Raphe Nuceus (MRN). We carried out in parallel the evaluation of anxiety state and pain perception in dehydrated rat. Findings revealed that dehydrated rats exhibited more preference for the dark compartment, suggesting that prolonged water deprivation causes a state of a significant relaxation state, in all water-deprived animals compared with controls. Surprisingly, in our dehydrated rats for 1 week, we noted a significant decrease of 5-HT immunohistochemical staining in DRN, and thereby the staining increases significantly in 2 weeks dehydrated rats, much more than control intensity of 5-HT expression in this nucleus. Our findings demonstrated also that TH-expression in DRN, MRN, SNc and VTA neuronal system is significantly and gradually enhanced, after hydric stress, as prolonged water deprivation for 1 and 2 weeks. In addition, our outcomes prove that all dehydrated rats were characterized by a significant and proportional rise of the reaction time to the nociceptive response in the hot plate test, as water deprivation duration increases, compared with control animals, suggesting that dehydration causes a significant decrease in pain perception. Finally, the data described here clearly show the implication of serotonin and dopamine neurotransmitter systems in the resistance to water stress induced by prolonged water deprivation in rat. Therefore, in this study, such central impairments have been traduced by a few peripheral consequences that are manifested by some changes in mood state and nociception.

Key words: *water deprivation, serotonin, dopamine, anxiety, pain perception, DRN, MRN, SNc, VTA*