RESILIENCE PSYCHOPHYSIOLOGY: PREVENTING BREAKDOWN THE BIOMARKERS THAT COULD ENHANCE RESILIENCE AND BREAKDOWN PREVENTION

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SUMMARY

Introduction: This paper draws a research project that aims to understand the psychophysiological gymnastics necessary to cope with the trauma's "pathosplastic gymnastic", elucidating the successful or adaptation magic of resilient individuals. As study justification we point motivation and curiosity to obtain an assertive answer to the question: How and Why individuals exposed to dramatic life events didn't develop PTSD or any psychopathological symptom but reveal their adaptive magic? This answer could not only enlightening protector, vulnerability and risk factors but also if this extraordinary individuals have a singular biology that enable us to find if resilience has a pattern of biomarkers which could provide the interventional tools to promote resilience and prevent breakdown, monitoring psychophysiology of resilience and consequently promote Health and Well-Being.

Keywords: Resilience, Prevention, Biomarkers, Pharmacotherapy.

PREVIOUS CONSIDERATIONS

Definitely the argument to bring to light the psychophysiology of resilience, it's the potentiality to promote Well-being and provide most effective insight about the extraordinary body of resilient individuals "what are made of" and "how it recovers homeostasis or balances itself" and knowing that exists already in the market oxytocin nasal spray and scientific literature indicates benefits of using it for PTSD (Eidelman-Rothman et al, 2015) and other disorders as autism spectrum, schizophrenia and depression (Barraza et al, 2013), we aim to contribute with this research project to the development of new pharmacotherapy and new benefits of use of those existing.

As Werner & Smith (1982), Werner (1992), Charney (2004), Ghafoori, B., Hierholzer, R., Howsepian, B. & Boardman, A. (2008), Lopez (2011), Ungar (2011) elucidated, a resilient individual is an extraordinary person who adapts successfully, showing better preparation to cope with adversity and to the imperious task of live life, developing the ability, in our words, of "rebuilding smile from pain". Trough resilience contributive characteristics training and with this research with eventual development of pharmacological support, we could formulate an effective breakdown prevention and resilience maintenance and development model. Being resilient is meant to develop the ability not only to resist but fundamentally to do not keep material to repression and inherent negative emotion that blocks Well-being.

When we assume to understand resilience, we must ally to its concept the elasticity or flexibility ability and the will to achieve Well-being. We should understand that resilient is who bounces back to balance and well-being state, who rises up, in spite of adversity, with hope and trust in the future and itself. Knowing that resilience is an innate and acquired competence, resilience can be modified and it should be understood in its several dimensions, as it presents of crucial importance, to an intervention model conceptualization, recognizing which resilience categories could be worked out to contribute to its development. Therefore, this research project aims to bring to light the relevant characteristics of resilience, revealing if there is a pattern of biomarkers associated with resilience and allosteric load, providing us a tool to promote well-being, in spite of adversity or traumatic experience, and enabling us to provide a prevention model of breakdown, and the necessary tools to monitoring psychophysiological resilience balance and to maintain or enhance resilience. At this point of our investigation, our scientific literature revision indicates that the most relevant categories of a resilient structure inherent to a flexible and resistant nature are empathy and attachment, fear, trust, motivation and reward, planning and control, implying the systems of oxytocin, vasopressin, cortisol, dehydroepiandrosteron, glycose, catecholamine and serotonin (Nobre, S.,2014). Though we intend to determine if there is any correlation between those parameters assessed trough urine, plasma or saliva analyses and resilience assessed by CD-RISC (Connor & Davidson, 2003, Portuguese validation by Faria & Ribeiro, 2008), of a representative sample of resilient individuals exposed to stressful/traumatic 6/20 events and didn't develop any psychopathological symptoms assessed by SCL90-R (Derogatis, 1993) and DSM IV-TR and DSM V criteria for PTSD. Our study is carry out with a sample of adult individuals with similar temperament, origin culture, ages and gender, recognized by their high level of resilience (superior of 73.4 mean level of Portuguese population - Faria et al, 2010 at http://www.cd-risc.com/user-guide.php, accessed 17 July 2016)

LITERATURE REVIEW

As Albuquerque et al (2003) warned approximately one of three individuals will be exposed to a severe traumatic event during life course, and although human being could most of the times recover from it and even sometimes benefit from the experience, developing their self-confidence, resistance and interpersonal relationships, could also develop psychopathologies as PTSD.

Greenberg, Brooks & Dunn (2015) corroborates that most people will experience a traumatic event during their lives and advise that research into the most effective ways to prevent individuals at risk of developing PTSD is still at an early stage and the development of effective early interventions could substantially reduce the morbidity associated with PTSD.

As first explained Werner&Smith (1982) and Werner (1992) resilience derives from genetic and environmental factors, and is determined by temperament, origin culture, age and gender. Charney (2004) reviewed the neurochemical, neuropeptide, hormonal and neural mechanisms that can be associated with resilience and Connor & Davidson (2003), Connor & Zhang (2006), Grafton, Gillespie & Henderson (2010), Seery, Holman & Silver (2010), Ungar (2011) corroborated the description of resilient individuals as strong personalities with ability to manage emotions and with a motivated and innate life energy, when experiencing adversity showing no signs of stress traumatic symptoms and capable of achieving success, knowing that even though they aren't invincible to all life events, they are able to cope, to recover and grow through stress, trauma or adversity, recognizing it as an opportunity to evolve and strengthen.

Lopez (2011) reinforced that resilience as an innate and acquired competence, deriving from idiosyncratic characteristics and experience, includes a set of internal and external mechanisms enhanced when adversity occurs, could be developed by cognitive transformation practices, education and environmental support, and resilience training could improve life's quality and reduce stress effects, and being a depression and anxiety treatment instrument and stress or trauma reaction. As the scientific literature indicates the relevance of emotional management, particularly love, to resilience as Ghafoori, Hierholzer, Howsepian & Boardman (2008) expressed, Grafton, Gillespie & Henderson (2010), Karreman &Vingerhoets (2012) confirmed that emotional and social abilities are the ones that allow the response to crisis events and/or necessity to adaptation.

Cicchetti (2010) remind us that the studies of resilience comprehends mostly the evaluation of individuals at hostile environments, as a way to prove their "adaptive magic" or resilience, though pointed out the necessity to study resilience in different contexts and illustrated that the biological system recovers in response to an intervention, due to its sensitivity to the environmental input during life course, putting in evidence the undeniable role of preventing interventions as a major contribute to recover and development or even rehabilitation of biological injuries in ways that only now are becoming postulated.

Skelton et al (2012), Bauer et al (2010), Jovanovic et al (2010), Nowotny et al (2010) having demonstrated that trauma induces neurochemical responses with large time spectrum effect including the magnitude of 7/20 catecholamine and cortisol as Bowirrat et al (2010) exposed, and Wu et al (2013) at this subject pointed the interest of the neurobiological systems of resilience research trough comparative studies with trauma exposed individuals whom developed PTSD and those who didn't.

Feder, Nestler & Charney (2010) pointed the necessity to study neural circuits that could be underlined resilience aiming the construction of new interventional models, as those illustrated by recent studies based in real-time fMRI, demonstrating the possibility of an individual to perform adequate training and regulate his own brain activity. Cicchetti (2010) and Chan, A.O.,Chan, Y.H.&Kee (2012) observed that resilient individuals have an innate ability (neural plasticity) superior to the norm to recover from environmental trauma with cerebral impact, and agreed that the paradigm of mostly resilience studies focused in hostile environmental and traumatic events doesn't describe the impact of positive environments, prevention or social support in resilience, becoming imperative the scientific research in this field of prevention, investigating the ways how experience change and psychological function resulting from preventing interventions could modify the biologic process.

Franklin, Saab & Mansuy (2012), Chan, A.O., Chan, Y.H. & Kee (2012), Karreman & Vingerhoets (2012), Bowes & Jaffee (2013) and Wu et al (2013) still indicate the importance and necessity to study the inter-relation between biologic and genetic mechanisms, and particularly of the neuroendocrine, hippocampal, cortical, reward and serotoninergic systems to establish and maintain resilience. Pfau&Russo (2015) advise that a budding area of research with great therapeutic promise involves the study of resilience, the adaptive maintenance of normal physiology and behavior despite exposure to marked psychological stress, and recommend that an enhanced focus on resilient subjects may enable us to harness mechanisms of resilience in the body and brain for the successful treatment of stress-related disorders and knowing that exists already in the market oxytocin nasal spray and scientific literature indicates benefits of using it for PTSD (Eidelman-Rothman et al, 2015) and other disorders as autism spectrum, schizophrenia and depression (Barraza et al, 2013), we aim to contribute with this research project to the development of new pharmacotherapy and new benefits of use of those existing, which confirm the pertinence and major interest of this pioneer research project.

SPECIFIC AIMS

Determining if resilience has a pattern of biomarkers by measuring the most relevant identified by scientific literature: oxytocin, vasopressin, cortisol, dehydroepiandrosterone, glycose, catecholamine and serotonin, in blood, urine or saliva of high resilient individuals.

RESEARCH PLANS

1st Phase
- Theoretical Definition
- Scientific Literature Review
- Selection of the group of individuals recognized by their resilience (military personnel, special forces of defense, individuals of elites political and economical, athletes)
- Institutional authorizations and informed consents

2nd Phase
- Empirical definition
- Data and psychological assessment instruments description.
- Psychological assessment of the individuals
- Verification of the inclusion and exclusion criteria of each assessed individual
- Methodology definition
- Blood, urine or saliva samples of the selected individuals.

3rd Phase
- Individual's psychological assessment
- Inclusion and exclusion criteria verification
- Individual's blood, urine or saliva samples
- Sample definition and description
- Methodology description
- Data base construction
- Scientific Literature Review

4th Phase
- Individual's psychological assessment (cont.)

- Inclusion and exclusion criteria verification (cont.)
- Individual's blood, urine or saliva samples (cont.)
- Sample description (cont.)
- Data Statistical analysis (SPSS)

5th Phase
- Theoretical maturation
- Results discussion
- Conclusions
- Suggestions and limitations

SAMPLE

We will consider a category of healthy individuals with similar characteristics about quality and trauma reaction, temperament, origin culture and gender, ages between 20-45 years old, with high resilience level and have been exposed to potentially stressful /traumatic events and didn't develop any PTSD symptom or any psychopathological symptom assessed by DSM IV-TR, DSM V and SCL90-R (Derogatis, 1993, validated to Portuguese population by Galhardo, Castilho & José Pinto Gouveia, 1999). We precognize that we should collect data from military personnel, special forces of defense, political and economical elite individuals, athletes, as the best subjects to this study due to its refered exceptional characteristics of resilience.

INCLUSION CRITERIA

Individuals as described above

EXCLUSION CRITERIA

Individuals with mental disorder diagnosis or with any psychopathological symptom or any risk behavior assessed or without high level of resilience (< = Portuguese mean)

PSYCHOLOGICAL ASSESSMENT

1- Specific elaborated interview resulting of sistematic scientific literature revision to collect socio-demographic data including age, gender, origin culture, nationality, profession, academic grade, civil status and to assess risk and coping behaviors as well resilience competences and stress/trauma quality of reaction and general satisfaction with life.
2- Assessment of PTSD by DSM IV-TR and DSM V criteria,
3- Assessment of psychopathology dimensions by SCL 90-R (Symptom Checklist-90-R, Derogatis, 1993, Portuguese validation by Galhardo, Castilho & Pinto-Gouveia, 1999 – Personality dimensions assessment: somatization, depression, anxiety, phobia, obsession/compulsion, hostility, paranoia, psychosis and interpersonal sensibility),
4- Resilience assessment (CDRISC, Connor & Davison, 2003, validated for Portuguese population by Faria & Ribeiro, 2008).

FINAL CONSIDERATIONS

This project aims to alert for resilient individual's *rupture*, as we identify the risk of breakdown on several recognized resilient professionals (authority figures, military forces, physicians, athletes, etc.), and still remains to explore resilience's psychobiology.

In this context and understanding the importance of stress management and the risk of ruptu-re without notice, we reviewed the literature in order to establish the lines of the necessary rese-

arch project constructed to contribute to the development of new models of therapeutic intervention to promote or recover resilience, through the training of idiosyncratic and environmental categories that contribute simultaneously to life satisfaction and ability to overcome adversity, and to illustrate the relevance of finding a pattern of biomarkers associated with allosteric load and loss of resilience to prevent sudden rupture, as it will allow to guarantee individual's resilience balance, through the inherent balance and supervision of its biomarkers' levels, eventually leading to the development of new psychopharmaceutical products.

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