Case report

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Reward Deficiency Syndrome phase two addiction treatment, targets the unique needs of the individual's brain: Project Reconceptualizing Addiction: The Elle Foundation Case Study 102

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Abstract

In the Elle Foundation, Case Study 102, the participant was given a Reward Deficiency Syndrome Symptom Checklist, in which she was asked about her dopamine deficiency symptom experience. The Reward Deficiency Syndrome Questionnaire (RDSQ-29)[1] was administered and the GARS, Genetic Addiction Risk Severity test [2] given in follow up. The GARS determined her predisposition for neurological challenge, in both dopaminergic and serotonergic channels, and her RDS phenotype [3].

In this retrospective, observational study, it is easy to discern the predictive value of the GARS, in 2020 hindsight, to determine predisposition for selective choice of various addictive behavioral paths to boosting dopamine deficiency [4] This participant's life experience is used to illustrate the new Reward Deficiency Syndrome paradigm, including the therapeutic value of the GARS [5], RDS Solutions for her phenotype (Blum et al., 2011) and RDS Solution Focused Brief Therapy (RDS-SFBT) [6], which is psychological education for overcoming dopamine deficiency, to achieve and maintain dopamine homeostasis [7].

Introduction

In the Elle Foundation Case Study 102, we build upon the Reward Deficiency Syndrome (RDS) foundation demonstrated in Case Study 101. Case Study 102 introduces analysis of a biological sister's Reward Deficiency Syndrome (RDS) risk score, as determined by Genetic Addiction Risk Severity (GARS) screening [8], to illustrate a new paradigm or lens through which to view substance use disorders and some mental illnesses [9][10][11][12]. For those with Reward Deficiency Syndrome, drug use is a predictable symptom, or outcome of the underlying dopamine deficiency challenge [13] [14][15].

Building upon the neurodevelopment model [16][17], the RDS paradigms focuses upon underlying neurogenetic challenge or impairment, that the individual is born with, or may acquire, which has potential for disruption of brain chemistry, leading to addiction and/or mental health disorders[18]. It addresses dopamine deficiency, with the goal of facilitating dopamine homeostasis. RDS Solutions, precision addiction management [19] and RDS Solution Focused Brief Therapy are a phase two treatment [20],to be initiated upon completion of substance use disorder treatment [21] [22], to address the unique neurogenetic challenges of the individual[23].

It is estimated that Homo sapien has between 25,000 to 30,000 genes. We are just going to look at the ten most common gene mutations, or eleven alleles found in clients with substance use disorders and mental health disorders. Alleles is the term used for different variations of genes. Genetic mutations are both inherited, and can be acquired through epigenetic response, as the brain adapts to environmental influences [24]. Genes, alone, do not determine outcome. It is the interaction between genetic and epigenetics influences which determines outcome.

This case study review highlights the importance of genetic screening, to become aware of genetic predisposition for psychopathology. The GARS screening can benefit prevention effort, by providing awareness of potential areas of neurological impairment [25]. For those still suffering from addiction's repetitive cycles of relapse [26], GARS results can inform

proper selection of pharmaceutical therapy, by consideration of mechanism of action. GARS also determines phenotype, for designer RDS Solutions, which include neuroadaptagen amino acid therapy (NAAT) [27][28][29][30], to aid in achieving dopamine homeostasis [31].

The Elle Foundation Case Study 102, is the biological sister of our proband, Case Study 101, [32][33], who is the subject of ongoing research analysis regarding family polymorphic gene variances which predispose mental health disorders, including but not limited to substance use disorders. The author utilizes this case study 102, to illustrate the new Reward Deficiency Syndrome paradigm [34], which advocates for a stage two, Reward Deficiency Syndrome Solutions treatment (RDSS) [35-41], based upon enlarged neurogenetic perspective, beyond the scope of the Hazelden Model.

In the 1980's, decades ago, when Case Study 102, was experiencing potential alcohol abuse issues, alcohol dependence was diagnosed through the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM), 3rd Edition. Today the DSM, 5th Edition, is the diagnostic standard, and alcohol dependence and/or abuse is now called Substance Use Disorder [42]. Our case study 102, sought the assistance of a mental health therapist, in the middle to latter 1980's, who looked closely, at her behavioral patterns, to discern, if they were serving her overall greater good, and to help the client determine, if these behaviors were in alignment with the subject's higher ideals and chosen purpose in life. Subsequently, the subject chose to stop using alcohol and attended twelve step meetings for a period of more than one year.

In the three and half decades since, the subject continued to seek freedom from dysfunctional family behavioral patterns [43] and achieved increasing degrees of autonomy and thriving. The subject excelled in tennis, personal fitness and nutrition. She earned her Life Coach certification, and became both a leader and role model for others in her community. The subject earned her Bachelors Degree in Psychology of Child Development and is an accomplished business woman. She has a long history of charitable work in addition to being a yearly tax payer, and good citizen without a criminal record.

Over the past thirty-five plus years, since she initially sought help with alcohol, it has not been necessary for Case Study 102 to work a twelve step program of abstinence from recreational usage of psychoactive drugs, mainly alcohol. She matured out of the problems of her early adulthood. She controls her impulses to use, and chooses balance along the continuum, or a harm reductionist theoretical stance, choosing when to imbibe, and when to walk away. Her occasional social use no longer interferes with the quality of her life, nor does it interfere with her taking care of her responsibilities. This case study has never required or merited in-patient treatment.

Ironically, Case Study 102, the biological sister, of our proband, Case study 101, has a greater degree of Reward Deficiency Syndrome predisposition risk, scoring 8 out of a possible 22. Our proband received a RDS risk score of 5 out of a possible 22 polymorphic variances. We will examine these polymorphic variances in greater detail for illustration of the RDS paradigm.

CASE STUDY 102 – Methods

Case Study 102 was determined to have the personality type ESFJ, based upon the Myers Briggs personality test. On the Neurotransmitter Balance Questionnaire, derived from "The Edge Effect," developed by Dr. Eric Braverman, her dominant chemistry scores were: 1A – Dopamine = 19; 1B – Acetylcholine = 24; 1C GABA = 36; and 1D – Serotonin = 20. The deficiency chemistry scores were: 2A dopamine = 4; 2B – Acetylcholine = 8; 2C- GABA = 10; and 2D Serotonin = 6.

The subject is a part of a convenience sample, of family members willing to participate in the Elle Foundation 100 series research case studies. This is an observational study, conducted retroactively, and retrospectively. The subject was given the Reward Deficiency Syndrome Symptom Checklist created for the Elle Foundation 100 series research study participants. She responded positively that she did have experience of the following: depression [44]; experience of being bullied; increased tolerance of substances used; compulsive shopping/spending; felt out of control; felt unlovable; codependency; family dysfunction; craving for foods; binging on the weekends; experience of mental health treatment through attending out-patient therapy; used illegal substances; and attended a twelve step group.

Subject indicated that she had either wondered if the following applied, or had received a diagnosis for, or had it suggested that she might need to be screened for the following: 1) Eating Disorders – which could include binging [45], purging, anorexia, excessive dieting, extreme weight gains or losses [46], and 2) Substance Use Disorders – which could include alcohol, pharmaceuticals, nicotine, illicit street drugs, like cocaine, or marijuana, etc., sugar, caffeine, etc.

When introduced to the new RDS criteria, Anhedonia [47] and Dysphoria, the subject did not recognize the subtle experience of Anhedonia, which is being defined for this study, as "an inability to feel good, or at ease; an uncurrent of discomfort; feeling as if something is not quite right in the body or mind, that you are somehow below zero in functioning, and/or an ongoing undercurrent of stress." She did, however, have a positive response to recognition of the new term Dysphoria, which we have defined for this research study as "an inability to handle frustration, or sit with the discomfort of Anhedonia, the feeling of a lack of adequate dopamine, which results in sudden rage or explosive, volatile behavioral which is not characteristic of your personality, like snapping, throwing your phone, or needing to scream."

The new RDSQ-29 was administered with the case study showing adequate RDS symptomology, to indicate need for further follow up through genetic investigation. The genetic addiction severity risk score (GARS) was administered. DNA

sample was collected through buccal swab and analyzed by Geneus Health, LLC in San Antonio, Texas. Test results were reviewed and approved by Patricia Jeffreys, MD, FCAP. (See Table 1).

Table 1: EF102 GARS® TEST RESULTS

Single Nucleotide Polymorphisms (SNPs)

Gene	Identifiers	Risk Allele	Patient Result	Risk Allele Count
COMT	rs4680(Val158Met)	G	A/A	0
DRD1	rs4532	A	A/A	2
DRD2/ ANKK1	rs1800497(Taq1A)	A	G/G	0
DRD3	rs6280	C	T/T	0
DRD4	rs1800955	C	C/C	2
OPRM1	Rs1799971	G	A/A	0

Variable Tandem Number Repeats & Insertion/Deletions

Gene	Identifiers	Risk Allele	Patient Results	Risk Allele Count
DAT1	rs8363170	<than 9 repeats	10R/10R	0
5-HTT-LINKED	rs4795541	S, LG	S/S	2
MAOA	rs768062321 (chrX*)	3.5R, 4R	4R/4R	2
DRD4	rs7610104587	> 7 repeats	4R/4R	0

Dinucleotide Repeat

Gene	Identifiers	Risk Allele	Patient Results	Risk Allele Count
GABRB3	Rs764926719	181	197/201	0

Score 8 out of possible 22 for females.

Discussion

We will look at the genetic results from the GARS and support findings with information provided by personal interview and the subject's background material. Results found serotonin challenge in reuptake. This family has a long history of mood disorders, depression and bi-polar disorder dating back several generations in female family members, from many interactive family lines intersecting through marriage. Specifically looking at the variable tandem, number repeats, insertions or deletions of the 5-HTT linked, RS 4795541 genetic polymorphic variance, this subject has both risk factors.

Notably, unlike most other neurotransmitters, serotonin is manufactured predominately in the gut. Many positive lifestyle behaviors, like exercise [48], physical fitness, nutrition and quality diet [49] benefit to serotonin function, potentially offsetting inherited serotonin challenge that might be influential in disorders. Benefits from regular exercise [50], increases wellbeing through increased endorphins, often minimizing depression[51]. The proband's family is passionate about sports. Case study 102 is known for her dedication to excellence in physical fitness. She was a tennis star for most of her life.

Ironically in early developmental periods of her life, she experienced obesity [52]. As a child of a working mother, she was positioned in front of a television, which served as a baby sitter, daily with a bag of potato chips and chip dip, at her grandmother's house, Monday through Friday afternoons after school. As should have been expected, weight gain followed. She experienced the emotional and psychological pain of being bullied for her size, and remembers being called "elephant," in the third grade, by her classmates at her new school.

She also experienced shame for her size in her family of origin, with her father setting the example, that women need to be pleasing to the eye to be valued. Too often, he spoke of breeder's hips with a negative connotation, as if having the necessary broadness in hip size to facilitate ease in reproduction was somehow unflattering. This family is of both Germanic and Viking heritage, upper standard deviations from the mean, in both height and weight, are to be expected.

While, granted, the passing down of improper psychopathological expectation of size is abusive, we also find from a literature review, that obesity is a common component of the dopaminergic dysfunction which is Reward Deficiency Syndrome [53]. The two most common RDS symptoms in the extended family, beyond just the 8, who have consented to be a part of this case series, are depression and obesity [54].

Her earliest known drug of choice is glucose, carbohydrates or sugar [55][56]. It seems a natural progression, to select alcohol as the new drug of choice, in young adulthood, when in a competitive collegiate environment. She followed socialized standards for her culture and ethnicity, while playing, undefeated, the number one position of the college tennis team. Those with a moderate RDS risk score of 7 or more, are likely to have issues with alcohol, and glucose, among other substance and nonsubstance behaviors. In retrospect her GARS results clearly indicate an increased likelihood, or predisposition for both eating disorder [57] and alcoholism [58].

The summary guide provided by Geneus Health details the substance use and non-substance behaviors associated with certain alleles of genes (geneushealth.com). The A allele of DRD1 receptor gene indicates behavior predisposition risks for alcohol and nicotine use, and the non-substance behavior of novelty seeking. The case study reports that she did smoke periodically for a few years, but did not allow herself to become incumbered by nicotine addiction over the long haul [59]. She laid the cigarette vice down and made healthier choices. She also reveals that she has indulged her predisposition for novelty seeking, usually through travel adventure, or shopping/retail

therapy, and on one occasion, through the high-risk behavior of sky diving. She is managing genetic challenge through proper control of impulse.

Individuals with the A1 variant of the DRD2 receptor gene, have behavior predisposition risks for substance use disorder involving alcohol, cannabis [60], glucose, heroin, nicotine, and opioids. They also have the non-substance behavioral predisposition risk for Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder (ADD/ADHD) [61][62], conduct disorder, gambling disorder, hypersexuality disorder [63], internet gaming [64-65] or gambling [66-68], novelty seeking, pathological aggression, as well as Post Traumatic Stress Disorder (PTSD).

Individuals with the S or LG allele of the 5-HTTLPR gene (which we discussed in the serotonin section above) have behavior predisposition risks for the following substances: alcohol, cannabis, cocaine, glucose, nicotine, and opioids. Non-substance use behaviors for these alleles include ADD/ADHD, pathological aggression, and PTSD [69].

Individuals with the 4R variant of the MAOA gene have behavioral predisposition risks for the following substances: alcohol, glucose, nicotine and opioids; and non-substance behaviors: ADD/ADHD, harm avoidance, and novelty seeking. Again, the Geneus Health Summary Guide provides detailed predisposition risk for GARS results found at geneushealth.com.

When Case Study 102 was presented with her GARS results, initially she did not know what they meant, understandably so. But when she was provided information on the new Reward Deficiency Syndrome paradigm, through psychoeducation provided in the RDS solution focused brief therapy, it began to make more sense. In her formative years, she had been taught that drug use led to addiction, as her therapy followed the Hazelden model of addiction.

With understanding of this new RDS paradigm, the case study 102 understands that neurogenetic challenge predates addiction, and for the most part determines addictive outcome. She understands that prolonged use of illicit street drugs and/or legal pharmaceutical drugs do in fact, cause further damage, to the brain, in what is known as epigenetic insult.

Summary

Case study 102 has mastered her genetic challenges through life style choices, self-discipline, and has lead a life advocating for the rights of children of addicts. She has been instrumental in providing a safe household environment for a child who was removed from his family of origin for reasons of active drug use, or substance use disorder. She has paid for this child's genetic addiction risk severity (GARS) screening for prevention purposes.

Why is it, that some individuals will try drugs and never become addicted? Or address drug abuse and return to a healthier lifestyle, while others seem to lose themselves in a downward spiral of increasing dependence? When asked what she thought the differences were in outcome, between herself and her sister, Case Study 101, the EF 100 research series proband, who suffered greater mental health disorder dysfunction, but who had a lower RDS risk score, CS102 states that her sister suffered early adverse sexual assault trauma, that she, herself, did not, as well as chronic pain issues. Case study 102 believes that experiential or environmental differences have been influential in her sister's more serious problems.

On a more positive psychological note, the Case Study 102 subject has an unshakeable religious faith [70-71]. She believes her faith, has allowed her to have resilience through life's hardships, which has included surviving breast cancer.

Case Study 102 conveys, that she believes, that if she had prior understanding of the Reward Deficiency Syndrome paradigm, psychoeducation for RDS solution focused brief therapy, and GARS testing results back in the time when her predispositions for alcoholism and eating disorders were causing problems, that she would have recovered more quickly [72]. She expresses gratitude for the enlarged perspective and the scientific advances in brain reward circuitry, which have produced Reward Deficiency Syndrome Solutions ™ (RDSS).

In hindsight, she understands that she would have had more resources to treat the underlying cause of her problems, beyond just mental health talk therapy and twelve step support groups, for help with her drinking. CS102 understands that these older modalities merely address the behavioral symptoms and not the underlying neurogenetic causal influences. She wants to help make sure that her children and future grandchildren have access to these resources, should the need arise. In other words, she wants them to have treatment for the underlying neurogenetic causal influences for substance use disorders, nonsubstance use disorders, obsessive, compulsive, impulsive mental health disorders, as well as the whole range of RDS symptomology which includes the Autism/Asperger spectrum, if or when they need it!

Conclusion

The GARS DNA results can provide a wealth of information, for RDS symptomology self-management and also for prevention, For some individuals, GARS results have informed proper pharmacological intervention, specifically targeting preferred mechanisms of action. This Elle Foundation 100 research series family is fortunate to have access to cutting edge Reward Deficiency Syndrome Solutions ™ (RDSS) for substance use disorder, non-substance, or behavioral process addictions, and comorbid mental health disorders which involve dopamine depletion or dopamine dysfunctions. Other families in our American culture, the United States and indeed, the world, are handicapped by mental health protocol which is more than fifty years out of date[73-80].

Reward Deficiency Syndrome Solution Focused Brief Therapy is a stage two treatment, to be initiated after completion of substance use disorder treatment. Psychoeducation for understanding the Reward Deficiency Syndrome paradigm can be outsourced by certified RDS professionals. This treatment looks closely at the underlying neurogenetics and intervenes to address the cause of addiction and other mental health disorders.

By addressing the neurogenetic challenges which precede addictions and mental health comorbidity, corrective action may be taken to address the dopamine depletion and deficiency challenge. RDS Solution Focused Brief Therapy provides psychoeducation to assist in self-management skill development to achieve and maintain, dopamine homeostasis, which may aid in prevention of potential future RDS dementias over the lifespan.

Clearly RDS is the phenotype and addiction, the endotype. Or in layman's terms, RDS is the disease, and addiction is the symptom. This is a bold statement and it is right on the money. Why wait one hundred years for the advancements of the research arena to trickle down into common knowledge of the public? People are dying. 100,000 were lost just last year to the opioid epidemic, within a pandemic.

For addiction therapists and mental health counselors who are interested in becoming certified in Reward Deficiency Syndrome Solution Focused Brief Therapy (RDS-SFBT), the 2022 Global Conference on Addiction Medicine, Behavioral Health and Psychiatry is providing a three hour seminar, for 6 continuing education credits in October 2022. For more information, please contact the Elle Foundation at 336-608-0881.

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