A Tipping Point for Developmental Trauma Treatment?

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Abstract

There has been a progressive appreciation of the importance of epigenetics, and in particular, developmental trauma, in mental disorder assessment and treatment. Now the underlying plastic brain structural and functional responses are becoming clearer, but treatment options have not been very effective in calming the fear-driven brain. Evidence is increasing that quantitative electroencephalography (qEEG) guided neurofeedback is of major benefit within comprehensive treatment programs, but such programs for the general public do not exist.

Key Words: developmental trauma/ complex PTSD/ epigenetics/ psychosis/ schizophrenia/ neurofeedback/ qEEG/

Paper

Having been involved with the NSW Service for the Treatment And Rehabilitation of Torture and Trauma Survivors (STARTTS) for over 30 years, I have watched the development of improved understanding of, and therapies for, every type of trauma found in refugees (Gurr 2001). It was not until I became the Clinical Director of the headspace Youth Early Psychosis Program (hYEPP) – ages 12-25, in Western Sydney, that I saw many young people with developmental trauma, walking through the doors of primary care headspace centres, or referred for assessment for first episode psychosis, or ultra high risk of developing psychosis. Their histories, leading to self-harming, depression, suicidal ideation, anxiety, post traumatic stress disorder (PTSD), eating disorders, substance abuse, dissociation and personality disorders, revealed the range of childhood traumas experienced (neglect, poverty, emotional abuse, violent abuse, sexual abuse, domestic violence, vicarious trauma etc.). As primary care headspace does not have the capacity to deal with complex issues and the hYEPP is a specialist psychosis program, where to refer these highly needy young people?

The Adverse Childhood Experiences (ACE) studies (Centers for Disease Control & Prevention, USA) concluded that child maltreatment was the most costly public health issue in the United States, calculating that the overall costs exceeded those of cancer or heart disease, and that eradicating child abuse in America would reduce the overall rate of depression by more than half, alcoholism by two-thirds, and suicide, serious drug abuse, and domestic violence by three quarters. It would also have a significantly positive effect on workplace performance, and vastly decrease the need for incarceration. Around 17% have 4 or more types of trauma with very significant effects on mental and physical health, and if 6 or more, life expectancy is reduced by 20 years.

Pinto Pereira et al (2017) used the data from 8,076 in the 1958 British birth cohort study, collected at age 16, with measures of employment, financial stability and social class at age 23 up to age 50. 21% had experienced one type of maltreatment, 10% two types, 16% some form of neglect, 10% psychological abuse and 1% sexual abuse. The odds ratio for long term sickness increased from 1.0 for no maltreatment to 1.76 for one type and up to 2.69 for two or more types. Exposure to sexual or non-sexual abuse was linked to the need for income support (OR 1.75). Neglect was associated with being unemployed, or not having education or training (OR 1.43), mediated by cognition and mental health. However, adolescent cognitive skills did not mediate when children were subjected

to sexual or non-sexual abuse, for unclear reasons. It could be argued that their brains are dysregulated so that cognitive processes will not restore function.

30 years of STARTTS offering training to clinicians, has not led to real growth in treating services. I speculate that it is because treatment has been difficult, as common treatments to calm dysregulated brains have provided limited benefits. Many do not fully respond to cognitive exposure therapy, dialectic behaviour therapy (DBT), eye movement desensitization and reprocessing (EMDR), operant conditioning such as using heart rate variability, and talking therapies. Those that do better have single or limited trauma events (e.g. PTSD is only a subset of responses to trauma). Most importantly I think there is avoidance of vicarious trauma from hearing trauma stories.

We need a developmentally appropriate trauma diagnosis (D'Andrea et al 2012). Children exposed to interpersonal victimisation often meet criteria for psychiatric disorders other than PTSD. A wide range of symptoms is common in victimised children and adolescents, related to genetic predisposition. For example the genetic risk for schizophrenia is 32% and epigenetics 68%. Symptoms include affect and behaviour dysregulation, disturbances of consciousness and cognition, alterations in attribution and schema, and interpersonal impairment. Currently multiple comorbid diagnoses, based on symptom clusters, are necessary, but not necessarily accurate, leading to both under-treatment and over-treatment, with a failure to actually treat the trauma.

Teicher & Samson (2016) have provided a very important review of plastic brain changes resulting from developmental trauma, which are evolutionary protective mechanisms to enable survival in a toxic environment, until the capacity to produce the next generation at puberty. The brain then switches from growth to pruning for efficiency, and behavioural programming switches to competing with peers for the best mate and resources for raising children. The previously protective changes cease to be helpful and may be harmful. Psychopathology may emerge due to the mismatch between the world the brain was modified to survive in and the world it finds itself in during subsequent developmental stages.

Ongoing research by Teicher's group has shown that the timing of stressors is important. The adolescent tasks of competing with peers, creates vulnerability to new plastic changes from bullying around 13-14 years. Then sexual abuse in girls becomes a major factor around 15 years. Teicher has more papers (including Schalinski & Teicher 2015, Schalinski et al 2017) and in the pipeline from their increasing library of functional magnetic resonance imaging (fMRI) and the use of the Maltreatment and Abuse Chronology of Exposure (MACE) assessment tool (Teicher & Parigger 2015). The major lesson is that the traumatised brain sees the world differently, reacts differently and the lack of recognition of this, and controlling for it, severely confounds most diagnostic and treatment research, based on symptom clusters, the basis for DSM-5.

A systematic review of developmental trauma subtypes and their association with onset and severity of psychiatric disorders in adulthood (Carr et al 2013) showed physical abuse, sexual abuse and unspecified neglect with mood disorders and anxiety disorders; emotional abuse with personality disorders and schizophrenia; and physical neglect with personality disorders. Sub-types in childhood and adolescence can predict the development of psychopathology in adults – they trigger, aggravate, maintain and increase the recurrence of psychiatric disorders. Emotional, physical and sexual abuse types of trauma generally lead to high anxiety and over-arousal on the qEEG, while neglect leads to under-arousal. Some episodes of trauma can lead to dissociative shut-down.

Being the victim of childhood abuse has been found to have a dose response relationship with psychosis, with experiencing mild, moderate and sever abuse being associated with 2,11 and 48

times, respectively, the likelihood of having "pathology level" psychosis, compared with no childhood trauma (Janssen et al, 2004). Conus et al (2010) in an audit study of 658 first episode psychosis patients, at what was the Early Psychosis Prevention and Intervention Centre (EPPIC) in Melbourne, found that 83% had at least one type of stressful event (separation of parents 42.1%; physical abuse 26.0%; death or loss of close other 21.1%; migration 18.5%; problems with partner 17.5%; sexual abuse 16.0%) and 34% had either or both physical and sexual abuse. Unfortunately the files had not recorded emotional abuse or neglect, which would have significantly increased the rates for multiple types of trauma. A systematic review of the association with the severity of hallucinations and delusions in psychotic disorders (Bailey et al 2018) showed significant dose related correlation, but not correlation with the severity of negative symptoms. Severity of childhood neglect was correlated with negative symptoms.

Symptom clusters, as the base for DSM-5, do not predict causation or treatment response. An example is Attention Deficit Hyperactivity Disorder (ADHD), where there is good evidence of developmental trauma as a strong factor in causation, and qEEG showing that there are 5 types of ADHD that will not be evident from symptoms alone (Kropotov 2016). Analysis of the qEEG and event related potentials (ERP) allows differentiation of brain functions that can lead to similar symptoms, through comparison with normative qEEG databases. Analysis of the person's qEEG enables personalised treatment (Kropotov 2016, Gunkelman 2014). The qEEG can be recorded pre and post treatment, to show abnormality returning to normal functioning.

The emerging application of qEEG assessment and qEEG guided operant conditioning neurofeedback (Sitaram et al 2017) could drive major changes in diagnostic categories and treatments, that utilise the developing brain's plasticity in correcting dysregulation. This includes improving the speed of communication where there has been excessive pruning in adolescence (Whitford et al, 2011), improving cognition, and the ability of the cortex to more effectively inhibit and fine tune emotions and behaviours. It is probable that the main cause of cognitive decline with psychosis is due to developmental trauma effects, well before the symptoms of psychosis emerge (Bora & Murray 2014), and possibly able to be improved by neurofeedback (Surmeli 2016). There is evidence that the operant conditioning by neurofeedback produces statistically significant upregulation of functional connectivity in the salience network (Ros et al 2010 & 2013).

The key studies that have applied neurofeedback to chronic conditions did not control for developmental trauma, except for chronic PTSD (Van Der Kolk et al 2016, Askovic et al 2017, Askovic & Gould 2009, Askovic et al in press). In spite of this, there have been good results for qEEG guided neurofeedback for chronic schizophrenia (Surmeli 2011, Bolea 2010, Nan et al 2017), Obsessive Compulsive Disorder (Surmeli 2011), Intellectual Disability (Surmeli 2016) and ADHD – many papers), where there was not a good response to treatment as usual.

For example, Surmeli (2011) treated 51 patients with chronic schizophrenia with neurofeedback. They had Positive And Negative Symptoms of Schizophrenia (PANSS) scores within the range 76-156, mean110.24 (SD 21.62). 47 out of 48 final participants showed clinical improvement, as the mean PANSS score decreased to 19.56 (SD 26.78) which was statistically significant, along with improvements in Minnesota Multiphasic Personality Inventory (MMPI) and Test Of Variables of Attention (TOVA) measurements. They were followed for around 2 years with the mean reduction in PANSS scores of 82%, where above 20% is considered good for antipsychotic medications (aripiprazole 30.1%, placebo 22.3% in adolescents – US FDA approval data). 19 ceased to meet criteria for schizophrenia, 27 no longer needed medication and the remaining 24 required about half their previous dosage and were more functional. However, as stated above, this study was confounded by not asking about developmental trauma or controlling for it, but because Surmeli

(and Bolea) was using qEEG guided neurofeedback, the qEEGs showed the signs of trauma, which were treated.

Now the confounding effects of developmental trauma are understood, for any mental health research that does not control for it, means that the outcomes are highly compromised. While there will be a placebo effect included (as with every psychiatric treatment – Hammond 2011), the long term follow-up rates in studies have shown that the improvements with neurofeedback have been permanent, unlike with medications and some brain stimulation techniques.

Mainstream psychiatry has been moulded by the state hospital systems, with their restricted training environments, and behaviour shaping by the pharmaceutical industry, towards a biological model of mental disorder (Read et al 2009). We have failed to find clear genetic causes and it is time we took on board the massive evidence for the role of epigenetics and social determinants of health. Psychiatrist have the important role in diagnosis, integrated to take account of all factors, bio-psycho-social, but we have failed to implement new knowledge. Psychiatry has basically ignored the effects of trauma on other diagnoses (Zammit et al 2018), so when 29 specialist mental health services actually screened for PTSD in adult patients, no matter what main diagnosis was given, around 30% scored positively, only 2.3% mentioned it in the case notes and no service actually treated the PTSD. As PTSD is only a subset of responses to trauma, many more were missed and probably not treated for emotional abuse, attachment disorders and neglect.

There is a strong connection between developmental trauma and persistent substance dependence in adults (Meier et al 2015). Around 70% of people with eating disorders have one or more types of developmental trauma at a significant level (Afifi et al 2017). Bryant et al (2018) showed that PTSD in refugees is associated with harsh parenting styles, leading to adverse effects on their children's mental health. There is plenty of evidence that developmental trauma can be passed on to the next generation, so treating the trauma is also a form of prevention. Early identification and treatment of those at risk before becoming parents, reducing poor choices and behaviours, domestic and social, could make a significant difference. This is why the 12-25 age group is so important for identification and treatment of developmental trauma.

Not systematically asking about child abuse in our diagnostic interviews is now ethically problematic. In spite of clinician concerns that to ask will open Pandora's Box, the opposite is true (Read et al 2007). People want to reveal their trauma, as it is often the core basis of their distress. The evidence is that we should ask as part of the initial assessment process, as the longer you put it off the less is revealed. What people detect is our reluctance to hear about their trauma, correctly interpreted as we are not emotionally strong enough to be helpful, to keep both parties safe and know how to effectively treat. Just as asking about suicide does not cause it, asking about trauma may be distressing, but it is a positive development in their recovery. The longer you leave it, the presentation is modified into one of our more acceptable diagnostic categories and treated as such, so the person learns to keep their trauma to themselves and despair about being truly helped.

Specialist services attempting to treat developmental trauma, whether for children, adolescents, youth or adults, have shown in their articles and books considerable consensus on what is needed to provide effective treatment (Courtois & Ford 2013, Ford & Courtois 2013, Hopper et al 2019, Briere & Lanktree 2012, Mendelson et al 2011, Blaustein & Kinniburgh 2010). There are four components – engagement and development of trust, regulation of emotions and other brain functions, dealing with the trauma with psychotherapies and then re-socialisation, as relationships are always affected.

There can be a hierarchy of care model, whereby simpler treatments, such as on-line education and therapy programs, will be enough to help some, but even then there can be a superficial appearance

of resilience that does not reverse the disturbance of brain functions and the effects on physical health. Developmental trauma always creates strong psychodynamic issues, such as disturbed attachment, and transferences (Herman 2015), while traumas experienced in adulthood may not. However, developmental trauma makes people vulnerable to more severe reactions to new stresses in adulthood. The Dunedin prospective cohort showed that severe maltreatment in the first decade of life leads to a significantly higher risk of PTSD when exposed to adult trauma by the age of 38, compared to no trauma, with 12.7% having a diagnosis of PTSD (Breslau et al 2014).

As much trauma occurs before the development of language, and there is evidence that language centres shut down when the brain moves resources to fight, flight or playing dead and dissociating, so language based therapies can be very slow to help. For most, particularly with youth, individual psychotherapy is required to provide re-parenting, with ancillary therapies, such as body work to connect to somatic memories (Van Der Kolk 2014). Brand et al (2017) did a systematic review of trauma focussed CBT interventions for people with psychosis, who also had a diagnosis of PTSD and across 25 studies found low effect sizes, poorly sustained when treatment ceased. Raio et al (2013) found that stress markedly impairs cognitive regulation of emotion and highlights critical limitations of CBT to control affective responses under stress.

The great challenge has been how to quickly re-regulate the brain, as it is clear that progress is slow until that has been achieved. Mindfulness, trauma sensitive yoga, sensory modulation, Capoeira, etc. have been tried with some success, but the real breakthrough has been neurofeedback for the most severe, who have not responded to other therapies. Sebern Fisher has been a pioneer, providing neurofeedback treatment to children and adolescents who were in institutional care, due to an inability to change their difficult behaviours (Fisher 2014). She was able to calm their fear-driven brains so that psychotherapy could work and the normal developmental roles be achieved. This is also the STARTTS experience with children and youth. Unfortunately, when the books listed above were published in the 2010-2013 period, it was before the benefits of neurofeedback were recognised. Even the latest book by Hopper et al (2019), while mentioning it, had not included it in their therapy. If qEEG guided neurofeedback could be applied as part of early intervention, the course of disorder and lived experience could be much better. The challenge now is to achieve investment in specialist treatment services with the critical mass and capacity to experiment and look for answers to the many questions, that require long term prospective studies. Rather than start with the mild to moderately affected by developmental trauma, weeding out many to meet narrow research requirements, we need to take on real world young people, the most severe with multiple problems, and welcome them. There is also a need for specialist perinatal/early childhood and adult (a large legacy group) programs.

Experience at STARTTS has shown that there are effective treatments in a hierarchy of care model. With refugees, engagement needs go beyond the individual to the whole family, ethnic group, religion, school and sports etc, to develop trust, security and a sense of identity in a new environment. They need group programs that enable re-socialisation in safe environments. This is also true with the traumatised youth we see at headspace.

Considering the personal, family and social pain and massive economic costs for those who have not responded to current treatments as usual, qEEG guided neurofeedback should be more extensively used in psychiatry practice. The risks are low if qEEG guidance is provided, as the brain finds its own solution, like earning to ride a bicycle. Once learned, it is not forgotten.

STARTTS has seen so many lives changed for the better and the savings to society have been huge. However, while fully controlled trials have yet to occur, which might take a very long time with

standard academic research funding and processes, we need to develop treatment skills and services that can provide for long term prospective studies. Research should be commissioned and this could be a role for the National Mental Health Commission.

The specialist pilot services must have critical mass to support a wide range of interlinked purposes: sufficient throughput for good statistical power in longitudinal prospective studies, diverse treatment skills and practices, training for internal and external clinicians, support for clinicians hearing trauma stories. A service design has been modelled and costed to achieve these goals (Gurr 2018).

It has been said that if we can effectively treat and prevent developmental trauma, it would be the greatest public heath initiative of all time.

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