



Revisiting parent–child interactions in early childhood as relevant factor in the development of ADHD

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In this issue of *European Child and Adolescent Psychiatry*, Joseph and colleagues investigated the presentation of depressive symptoms in a large, community-based sample of young children (6–8 years) with and without ADHD. This study extends previous work by showing that increased depressive symptom levels are already present in children with ADHD as young as age six. Sadness, irritability, insomnia, psychomotor agitation, feeling bad about oneself, difficulty concentrating, and making decisions were among the symptoms more frequently occurring in children with ADHD as compared to those without. These findings highlight the importance of early detection and treatment of depressive symptoms in young children with ADHD.

Although mechanisms explaining the high frequency of depressive symptoms in these young children were not investigated, the authors notice that caregiver's mental health difficulties may be a relevant factor. This would indeed be in line with the existing literature, showing that (1) parents of children with ADHD often experience mental health problems themselves (including ADHD and depression) [1, 2] (2) depression in parents increases the development of depressive symptoms in (very) young children amongst

other factors through influencing parenting practices [3, 4], and (3) treatment of parental depression and/or parent–child interaction therapy may reduce depression in young children [5]. Indirectly these findings support the relevance of including the early parent–child interaction as relevant domain in the search for early risk pathways towards the development of ADHD and its comorbidities.

We propose that Emotion Dysregulation (ED) in parent–child interaction is such a risk pathway. Parents play a pivotal role in supporting and promoting emotion regulation during early childhood. The literature on children's social development, a field of research which has developed virtually independent of the ADHD literature, clearly shows that parents are the most influential in facilitating and promoting young children's ability to develop effective strategies to regulate their emotions. The early development of effective emotion regulation abilities—especially in easily dysregulated children—is strongly dependent on a context of safe, supportive, and well-adapted parent–child relationships, wherein parents are able to support and stimulate the child's emotion regulation capacities [6]. Of great relevance is that a recent study indicates that parental use of emotion socialization practices (both supportive and non-supportive) has a relatively stronger impact on children with high ADHD symptomatology [7]. This suggests that parental use of adaptive emotion socialization practices may be particularly relevant in the context of susceptibility towards developing ADHD.

Reversely, children do also play a pivotal role in influencing parental emotion regulation. Studies show that parents who have toddlers with disruptive behavior problems exhibited more hostile attributional biases and emotion flooding, as well as more negative discipline practices [8]. Toddlers who continue to exhibit strong emotion dysregulation in the context of challenging temperamental styles (so-called 'difficult temperament') tend to elicit more negative, unresponsive, and/or punitive reactions from parents during this age period [6]. Children's behavior problems and parents'

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unsupportive emotion socialization practices can become mutually maintaining and reinforcing coercive patterns in a negative family environment, with a poor match between child and parent characteristics (i.e., poor 'goodness of fit') [9]. These patterns cannot completely be accounted for by shared genetic influences between child and parents, since in adoption families, the same aversive parent–child interaction spirals have been documented [10].

Importantly, a review showed that EDs seem to be a key precursor of ADHD that manifests itself already in infants at a very young age in a substantial subset of children who later develop ADHD [11]. A recently published study confirms this finding showing that excitability (emotion dysregulation of positive emotions) in young children age 3–5 years predicts an ADHD diagnosis at age 14–19 years [12]. Moreover, already in infancy, excessive infant crying during the 13th week after birth doubles the risk of hyperactivity at age 5–6 [13]. Also ED during middle/late childhood is predictive for experiencing later ADHD symptoms [14]. It may well be the case that the participants described in the study of Joseph and colleagues may have shown depressive symptoms at an even earlier age than now investigated, an age preceding a clinical diagnosis of ADHD. As ADHD runs in families, parent–child reciprocal influences on emotion dysregulation are likely to be particularly prevalent in families with a high familial risk for ADHD: (1) ED is highly prevalent in adults with ADHD; (2) about half of the parents with ADHD have a child who will develop ADHD and about half of these children will have ED levels that are not observed in the general population; and (3) children exhibiting ED show increased sensitivity to parental ED as compared to children without ED being exposed to the same parenting practices. Goodness of fit between parent and child characteristics is, therefore, a critical factor in the context of ADHD risk [9], and is at the same time harder to accomplish given that the ED problems run in these families. A recent study shows that already during pregnancy, poor maternal emotion regulation is predictive of ED in newborns [15]. Persistence thereof may pave the way to increasingly poor self-control (i.e., the capacity to override automatic responses through controlled processing) relevant when entering primary school. This poor self-control surfaces in the context of school-challenges as a poor ability to maintain focus, sit still, and await turn, which are important symptoms of ADHD. Therefore, intervention improving parent–child emotion regulation in high ADHD-risk parent–child relationships in early childhood may in theory have a positive impact on the onset of ADHD in the child.

Several well-described early intervention programs have been developed and tested for preschoolers (4–7 year olds) displaying high levels of ADHD and/or oppositional behavior, such as the Triple-P, New Forest Parenting Programme, and Incredible Years. These programs have been shown to

have moderate effects on reducing ADHD symptoms and moderate-to-large effects on reducing behavioral problems. To our knowledge, only two small-scale studies have examined programs specifically targeting parental emotion socialization in the context of ADHD [16, 17]. These studies show the potential of improving child's ED and ADHD/externalizing problems through intervention directed at improving parental emotion socialization practices. Importantly, these studies selected children that already showed clear manifestations of ADHD, instead of selecting younger children with elevated ED, but not yet full ADHD. It thus remains untested whether the liability for ADHD will not unfold into the full extreme by improving the parent–child interactions supporting and promoting emotion regulation abilities in young children.

As we reviewed above, early intervention in young children with ADHD has gained some ground in the past decade, but research on prevention is virtually absent. Thorough studies focusing on the pre-onset period are scarce, especially in early years (from birth to preschool age), while such studies are critical in untangling the causes from the consequences of ADHD. The main reason for this is the current dominant deterministic view on the causes of ADHD, postulating that onset of this condition is not amenable to change. Indeed, ADHD is known to be among the most heritable psychiatric disorders with genetic factors accounting for ~70–75% of the variance. However, highly heritable conditions can also be highly susceptible to environmental conditions, with the prototypic example of significant increases in height due to improved nutrition in the last 100 years. Interventions cannot change the genetic liability of ADHD as it runs through families affected by ADHD, but can improve the circumstances for young offspring, such that their liability may not unfold into the full extreme. Further work is required to increase insights in the developmental processes leading to an onset of ADHD and to study whether early intervention targeted at these processes can prevent the development of clinical ADHD. Such studies may ultimately pave the way for early screening and intervention programs for high-risk children.

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