ITEM 87/19

	Public Health Review – Sensory Diets
Issue/topic	Are sensory diets a therapy we should be funding or promoting to be incorporated in a pathway?
Requestor and purpose	Policy Development Team on behalf of Healthier Lancashire & South Cumbria CYP commissioners' network
Date	12 September 2019, Revisited January 2020

Background to request:

Morecambe Bay CCG received a request to fund a "Sensory Diet" intervention from the parents of a child with autism. The parents had consulted a private provider who assessed the child and recommended that they would benefit from a course of sessions of this therapy. This was incorporated in the child's Education, Health and Care plan (EHC) Plan (a legal document which describes a child's special educational needs) and following a SEND tribunal the CCG were obliged to pay. The issue was discussed with other commissioners of children's services and further investigation was requested from the Policy Development Team.

Introduction to the topic:

The question would seem to be whether using a "sensory diet" approach produces improved outcomes and what specific outcomes are improved? The private provider (see next paragraph) states that the objective of a sensory diet is to regulate sensory reactivity to support the child's ability to control his/her responses to sensation. They state that adequate sensory reactivity allows the child to experience the sensations of daily life in a way that facilitates optimal participation in developmentally appropriate tasks.

The private provider referred to is *Coordinated Kids*. Their website http://coordinatedkids.co.uk/ describes Sensory Integration (SI) as the neurological process that organises sensation from one's own body and the environment. Although it gives several references in the form of "It enables everyday life (Allen and Smith 2011)", there are no links, nor full references given to allow follow-up.

Their website describes sensory processing disorder (SPD) aka dysfunction in sensory integration (DSI), which can influence self-regulation, movement, learning and interaction with others. They claim that these disorders can occur across the lifespan and can be seen in isolation, or more commonly with autism spectrum disorders (ASD), ADHD, learning disabilities and others.

However, the American Academy of Pediatrics released a policy statement in 2012 advising against using sensory processing disorder (SPD) as a diagnosis, as difficulty tolerating or processing sensory information is a characteristic that may be seen in many conditions. They went on to add that

Occupational Therapy using sensory-based techniques may be helpful as one component of a comprehensive treatment plan but that parents should be informed that research regarding the effectiveness of sensory integration therapy is inconclusive[1].

Coordinated Kids refer to Ayre's model of the sensory integrative process, give a website address (without link) for sensationalbrain.com which is a commercial website from the US selling BrainWorks therapy resources and courses to "meet the needs of kids with sensory processing disorders". This website does give 5 references including a poster presentation entitled "Gum chewing effects academic performance in adolescents". Putting this in a search engine revealed an item in "Confectionary News" from 2009 referring to the Wrigley study (funded by the Wrigley Science Institute that found that students who chewed gum showed an increase in standardized (sic) math test scores from which the authors concluded "These results show chewing gum may be a cost-effective and easily implemented method to increase student performance". (*Apologies for providing all this detail which may not seem relevant; it is included to demonstrate the standard of the evidence base used by the service).*

Definition of the condition/s.

Autism spectrum disorder (ASD) is a complex developmental condition, behaviourally-defined, that includes a range of possible developmental impairments in reciprocal social interaction and communication, and also a stereotyped, repetitive or limited behavioural repertoire. Sensory differences may also be a presenting feature. ASD may occur in association with any level of general intellectual/learning ability, and manifestations range from subtle problems of understanding and impaired social function to severe disabilities.

Abnormalities in responses to sensory stimuli are highly prevalent in individuals with ASD. The underlying neurobiology of these symptoms is unclear, but several theories have been proposed linking possible aetiologies of sensory dysfunction with known abnormalities in brain structure and function that are associated with ASD. In addition to the distress that sensory symptoms can cause patients and caregivers, these phenomena have been correlated with several other problematic symptoms and behaviours associated with ASD, including restrictive and repetitive behaviour, self-injurious behaviour, anxiety, inattention, and gastrointestinal complaints. It is unclear whether these correlations are causative in nature or whether they are due to shared underlying pathophysiology[2].

Prevalence / incidence

There isn't an exact national prevalence of autism available, just the assertion that around 700,000 people, or 1.1% of the population may be autistic[3]. There is very good data available for Northern Ireland, as detailed school surveys are conducted annually. According to the 2019 published data, 3.3% of school age children (up to age 15/16) are estimated to have autism. This has grown from 1.2% ten years ago[4], and showing no signs of slowing down, with the numbers increasing 12% per year. They also report children living in urban areas are 1½ times more likely to be diagnosed with autism.

The number of pre-school children with autism is not recorded, but we do have data from Lancashire schools via the County Council (see next page).

Pupils numbers for Blackburn with Darwen, Blackpool and South Cumbria have not been requested.

Autism prevalence in schools in Lancashire – i.e. autism recorded in their SEND (Special Educational Need and Disability) status

School type	Number of children registered as having autism	Percentage of SEND pupils	Population	Prevalence per thousand pupils
Primary	743	6%	101,438	0.73
Secondary	808	13%	67,962	1.2
Special	884	30%	2,966	29.8
TOTAL	2435		172,366	1.4

Data source: School Improvement Team, Lancashire County Council (personal communication)

Treatment

The best-known treatments for sensory symptoms in ASD involve a program of occupational therapy that is specifically tailored to the needs of the individual and that may include sensory integration therapy, a sensory diet, and environmental modifications. While some empirical evidence supports these treatments, more research is needed to evaluate their efficacy, and other means of alleviating these symptoms, including possible psychopharmacological interventions, need to be explored[1].

Sensory integration is one of the most highly utilized interventions in autism, however, there is a lack of consensus regarding its evidence base[5].

In current practice, sensory interventions apply different theoretic constructs, focus on different goals, use a variety of sensory modalities, and involve markedly disparate procedures[6].

From the Coordinated Kids' website sensory diets involve use of individually tailored sensory activities for parents, carers and teachers to complete with the child at home and school in order to achieve an optimal arousal level throughout the day. The objective of regulating sensory reactivity is to support the child's ability to control his/her responses to sensation through active, individually tailored sensory based activities. They describe sensory integration therapy as direct one-to-one therapy with an OT, physiotherapist or speech and language therapist who has completed specific post-graduation qualification in Ayres' SI Therapy (Ulster University) https://www.sensoryintegration.org.uk/page-18208.

What does the research say? Presented in order of robustness of evidence and most recent first.

Systematic reviews

The most recent relevant systematic review was published in January 2019. This robust review evaluated the effectiveness research from 2006 to 2017 on Ayres Sensory Integration (ASI) intervention for children with autism, and based on high quality trials concluded that ASI can be considered an evidence-based intervention for children with autism aged 4 to 12[2].

A systematic review of the literature published from 2007 to 2015 related to the effectiveness of occupational therapy interventions using parental or teacher education and coaching with children with challenges in sensory processing and sensory integration (SP-SI). They found that such programs

could result in positive outcomes for both parents and children, often in a relatively short time period. Recommendations included a greater focus on providing educational interventions for parents and teachers and including specific assessment of SP-SI before implementing interventions meant to address those issues[7].

A systematic review of the research evidence (2000-2012) of two forms of sensory interventions, sensory integration therapy and sensory-based intervention, for children with autism spectrum disorders and concurrent sensory processing problems. The studies defined sensory integration therapies as clinic-based interventions that use sensory-rich, child-directed activities to improve a child's adaptive responses to sensory experiences. Two randomized controlled trials found positive effects for sensory integration therapy on child performance using Goal Attainment Scaling; other studies found positive effects on reducing behaviors linked to sensory problems. The authors stated that although small randomized controlled trials have resulted in positive effects for sensory integration therapies, additional rigorous trials using manualized protocols for sensory integration therapy were needed to evaluate effects for children with autism spectrum disorders and sensory processing problems[8].

Controlled trials

An excellent protocol was published in 2016 detailing a pragmatic randomised controlled trial of sensory integration therapy versus usual care for sensory processing difficulties in ASD in children[9]. Data collection started in 2017 and finished in spring 2019. When published it will provide very helpful information in relation to the effectiveness of SI therapy.

Other literature – very small studies

The purpose of this study was to determine whether SI treatments could reduce automatically-maintained stereotypy (the persistent repetition of an act for no obvious purpose). Five individuals with autism participated. An occupational therapist prescribed sensory activities that competed with stereotypy for SI treatments. Two types of SI treatments were tested: sensory diets and brushing with deep-pressure therapy. The effect of these treatments on stereotypy was evaluated in an ABAB design. Neither the sensory diet alone, brushing and deep pressure alone, nor both treatments combined were effective interventions for stereotypy. These results do not support the use of SI as a treatment for stereotypy[10].

A qualitative study was described in a poster “Understanding the Use of Family-Centred Principles by Early Intervention Occupational Therapists in the Development of Sensory Diets”[11] presented in April 2018 describing how early intervention OTs were using principles of family-centred practice when educating families of children with ASD about their child’s sensory diet. (This was given on the Brainworks website – it does not assess effectiveness).

A pilot project from 2011 explored the use of telerehabilitation for collaborative occupational therapy sessions with parents of children with autism spectrum disorders (ASD). The aim was to improve carryover of therapeutic strategies by parents to address children's sensory modulation in their natural environments. Four families participated in clinic-based sessions with the therapist followed by online sessions for six weeks. Data consisted of family schedules, sensory diets, archived webcam sessions, and Sensory Processing Measure Home Form scores before and after initiation of the telerehabilitation sessions. Results demonstrated the potential for using telerehabilitation as a tool to

provide collaborative occupational therapy in order to improve carryover of home programs for children with ASD by providing opportunities for parents to ask questions, review sensory techniques, and understand the therapist's clinical reasoning[12].

Guidance

NICE Guidance Autism spectrum disorder in under 19s: support and management[13] covers support and treatment for children, parents and carers. It details specific interventions for the core features of autism.

- Psychosocial interventions – social-communication including play-based strategies for children involving parents, teachers and carers to increase joint attention, engagement and reciprocal communication – delivered by a trained professional.
- Pharmacological and dietary interventions – a list of drugs not to be used. Exclusion diets not to be used.
- Interventions for behaviour that challenges – a comprehensive assessment (no mention of sensory assessment), followed by production a care plan outlining treatment, support and necessary adjustments.
- Interventions for sleep problems

Sensory integration/ sensory diets are not mentioned.

SIGN (Scottish Intercollegiate Guideline Network) 2016 Guidance states “Children and young people affected by ASD may benefit from Occupational Therapy, advice and support in adapting environments, activities and routines in daily life”. It also stated that there was insufficient high quality evidence to support the use of Sensory Integration Therapy (section 6.3.5)[14].

Recommendation

Commissioners may wish to consider how this therapy would fit into the general therapy offer for children with autism.

[redacted]
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Date: 5/9/19

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