Occupational Therapy in Attention Deficit Hyperactive Disorder

ABSTRACT : ADHD is recognized as "Executive Dysfunction". It is a Neuro Developmental Disorder. Root cause may be Sensory Integrative Dysfunction and Cognitive Perceptomotor Dysfunction, which have profound effect on a child's participation, in everyday "occupations", eg play, study and family activities. Collaboration between therapist, teacher and parent is the most efficient way to understand the child's behaviour who can implement strategies to support the child's performance in multiple environments. Fostering the child's participation in normal everyday childhood activities is the main goal of Occupational Therapy.

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Attention Deficit Hyperactive Disorder [ADHD] is a Neuro Developmental Disorder that becomes evident during early childhood and hits its peek by middle childhood. It is characterized by

- Hyperactivity
- Inattention and
- Impulsivity

They have significant impairment in social, academic or occupational functioning.

Currently ADHD is recognized as Impairment of "Executive Functions". "Executive Functions" [EF] are management functions of the mind.

They activate, regulate and integrate a wide variety of other mental functions.

Ability to activate and sustain attention, alertness, effort etc in situations not intrinsically interesting is a key component of EF.

ADHD is seen in 3-5% of all school going children

ADHD IS OFTEN CO-MORBID WITH CONDITIONS SUCH AS

- Oppositional Defiant Disorder
- Conduct Disorder
- Specific Learning Disabilities
- Depressive Disorder

Individuals with ADHD tend to report chronic impairment in 6 clusters of functions related to EF.

1] Organizing, prioritizing and activating for work tasks.
2] Focusing and sustaining attention to tasks.
3] Sustaining alertness, effort and processing speed.
4] Managing frustration and modulating affect
5] Utilizing working memory and accessing recall
6] Inhibiting and regulating verbal and motoric action.

If we look from the Occupational Therapy point of view, Children with ADHD has two main difficulties.

1] Sensory Integrative Dysfunctions.
2] Cognitive Perceptomotor Dysfunctions.

1] Sensory Integration

A] What is Sensory Integration ?

Sensory Integration is a theory developed over more than 20 years by A. Jean Ayres, an Occupational Therapist with advanced training in neuroscience and educational psychology.

Ayres [1972] defines Sensory Integration as "the neurological process" that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment."

The theory is used to explain the relationship between the brain and behaviour and explains why individuals respond in a certain way to sensory input and how it affects behaviour.

The five main senses are

- Touch - tactile
- Sound - auditory
- Sight - visual
- Taste - gustatory
- Smell - olfactory

In addition, there are two other powerful senses

Vestibular [Movement and balance sense] provides information about where the head and body are in space and in relation to the earth's surface.

Proprioception [Joint/ Muscle sense] provides information about where body parts are and what they are doing.

Our brain efficiently take in, sort out and use sensory information from the environment by these seven interconnected sensory channels.

B] What is Sensory Integration Dysfunction ?

Dysfunction in Sensory Integration is the "inability to modulate, discriminate, co-ordinate or organise sensations adaptively".

C] How effectively we process Sensory Information

- Discriminate Sensory Information – to obtain precise information from the body and the environment in order to physically interact with people and objects. An accurate body scheme is necessary for motor planning ie being able to plan unfamiliar movements. It involves having an idea of what to do, planning, sequencing, required movements and executing movements in a well–timed, co-ordinated manner.
- Modulate Sensory Information – to adjust to circumstances and maintain optimum arousal for the task at hand. Sensory Modulation is the "capacity to regulate and organize the degree, intensity and nature of response to sensory input in a graded and adaptive manner".
- It is the ability to take in relevant sensory information from the environment and to screen out, or inhibit non-essential sensory information such as background noises and extraneous visual information.

The child with ADHD may appear

- Distractive
- Hyperactive or uninhibited
- Unresponsive to stimuli.
- Poor coping mechanism.

Sensory Defensiveness, a type of Sensory Modulation Problem, is defined as "a Constellation of symptoms related to aversive or defensive reactions to non-noxious stimuli across one or more sensory systems". It can affect changes in state of alertness, emotional tone and stress.

D] How is DSI identified ? [Dysfunction in Sensory Integration]

DSI is identified through evaluation by an Occupational Therapist who has knowledge of

Sensory Integration, using one or more of the following practices

- Gathering information about the child's performance in daily life tasks within the context of the classroom, school and home environment.
- Skilled observation of the child: by setting up play environment and observing the child's responses to different types of sensory input and motor planning ability.
- Parent / Caregiver Sensory Questionnaires, Standardized Checklists eg Sensory Profile [Dunn, 1999], non-standardized checklists.
- Parent / Caregiver interview: the therapist identifies specific functional problems related to problem with sensory processing.
- Standardized test of general development and motor functioning eg Sensory Integration Praxis Test Battery [SIPT] [Ayres, 1989].
- Clinical Observation of posture, co-ordination etc.

2] Cognitive Perceptomotor Process (CPM)

The main function of perceptual motor process is that of interpreting information received through sensory process.

It is intermediate between the sensory and cognition process.

It is dependent on sensory process and organization of sensory information.

Perception is a pre-requisite for all complex human behavior as it promotes cognitive functions.

CPM Dysfunctions

1. Motor Problems

A] Inadequate Co-ordination.

B] Poor Tactile kinesthetic discrimination difficulty in discriminating shapes, textures. Sizes only through touching.

2. Visual Perception Problems

A] Poor Visual Discrimination

Cannot find out similarities/ differences between objects, shapes, symbols visually.

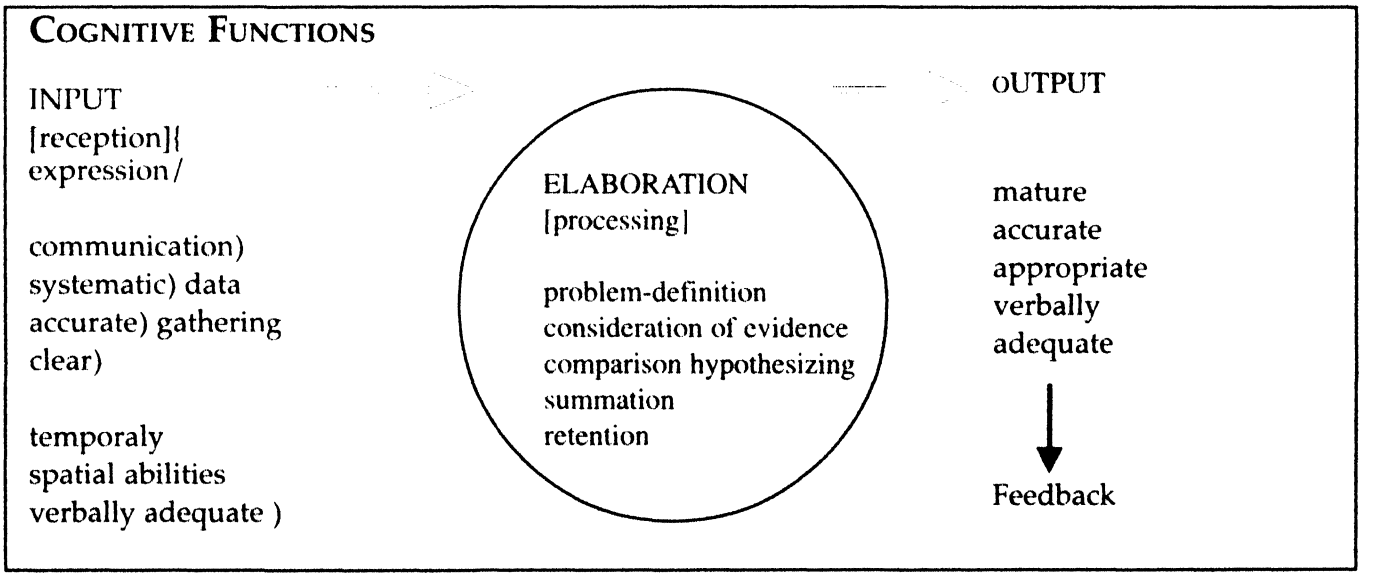
B] Difficulty in visual figure ground discrimination

1] May skip lines while reading / writing

2] Unable to interpret pictures.

C] Difficulty in visual closure

Cannot fill in missing parts



3. Auditory Perceptual Problems

A] Poor Auditory Discrimination

Unable to distinguish one sound from another.

B] Poor Auditory Reception/ Comprehension.

Unable to gain meaning from auditory symbols.

C] Difficulty in Auditory figure ground differentiation.

Cannot concentrate on verbal discussion for long time.

Easily distracted by other environmental sounds.

4. Orientation Skills

A] Inadequate Spatial Organization

Poorly developed concept of space.

Distorted body image.

Trouble in judging distance and size.

B] Inadequate Temporal Concepts

Disoriented in time.

Experiences trouble in relating concepts like before and after, now and when, today and tomorrow.

Intervention

1 Intervention is guided by child interests, family concerns and therapist's knowledge.

2 A variety of treatment approaches are considered; more than one may be used to help a child at one or more points in time, or one approach may be used alone.

3 Individual treatment [classical sensory integration treatment]

Child is seen 1:1 in a specifically designed therapeutic setting.

1 Takes place on a 1: 1 basis in a room with suspended equipment for varying movement and sensory experiences.

2 The goal is not to teach skills, but to follow the child's lead and artfully select and modify activities according to the child's responses.

3 Provide variety of opportunities to experience tactile, vestibular, and proprioceptive input in a way that provides the "just right challenge" for the child to promote increasingly more complex adaptive responses to environmental challenges.

Playful Context

It has

a. Intrinsic motivation of child
b. Fun
c. Spontaneous quality
   - Emphasis on eliciting adaptive responses
   - Balances between structure and freedom
   - Therapist aims to provide "just-right challenge".
   - Activities during therapy are constantly adjusted based upon child's responses
   - Therapy is guided by child interests and responses, balanced by therapist's knowledge and priorities.
   - Goal is to improve the long-range efficiency of the child's sensory integrative functions, ultimately resulting in enhanced social participation.

Sensory Integration 1:1 Intervention

1] Provision of Sensory Stimulation in the area in which the children show abnormal responses. "Just right challenge".

2] Setting up a situation in which the children are actively and spontaneously involved. Environmental modifications eg Reducing distracting visual materials.

3] Acquisition of adaptive responses.

4] Sensory diet regularly throughout the day. A Sensory diet is a strategy that consists of

a carefully planned practical programme of specific activities that is scheduled according to each child's individual needs. Like a diet designed to meet an individual's nutritional needs. The sensory diet is based on the notion that controlled sensory input which can affect one's functional abilities. A sensory diet can help maintain an age appropriate level of attention for optimal function to reduce sensory defensiveness.

Receive beneficial sensory input at frequent intervals. Enabling him or her to participate meaningfully in the activities. "How does your Engine Run? "Programme [Williams and Shellenberger 1994]

It is a step by step method that teaches children simple changes to their daily routine eg

1] Brisk walk, jumping on a trampoline prior to doing their homework. Listening to calming music.
2] This helps them self regulate or keep their engine running "Just right".
3] Through the use of charts, worksheets and activities, the child is guided in improving awareness and using self regulation strategies.
4] Changes in how people interact with the child.

The result is improved performance of skills that relate to life roles e.g player, student.

It develops self regulation/ arousal [to attain and maintain alertness], praxis [organise, plan and execute skills of all kinds in a refined and efficient manner].

This type of intervention may be used along with other treatment approaches.

4] Perceptual motor approaches

- Sessions are pre-planned and directed by the therapist.
- Activities are drilled to teach skills.
- Focus of treatment is on motor execution.
- Resembles classroom model with repetitive drill
- Use of feed back mechanism to correct misperception and planning, reorganize and plan action, execute action till it is correct and then learn the pattern.

5] Multi Sensorial Approach

- Developing perception, memory, association for mastering language, reading, writing and arithmetic skills by using multisensory channels
  ie auditory, visual, tactile, kinesthetic.

6[Psychoeducational Approach

- Training through learning style and pattern of the child. Child may be an auditory learner, or visual learner and may be learning by performing depending upon the preference of child, the child is taught through that pattern predominantly.
- Build on strength of the child.
- Ameleorate Deficit.

7] Behavioural Approaches.

- Use of extrinsic rewards or avoidance of punishment to elicit a response.
- Goals relate to specific behaviours and generalizable abilities.

8] Group Programmes

- Grouping of children of similar age or developmental issues.
- Usually focused on particular skill areas e.g social skills, pre-sports skills.
- Can be after-school programs, day camps, or overnight camps.

Goal usually is to develop specific "splinter skills" currently needed by child.

- Alert programme ("How Does Your Engine Run?") teaches child to recognize his or her own arousal patterns and sensory activities that can be consciously

used to influence arousal level.

9] ENVIRONMENTAL MODIFICATION TO HELP THE CHILD COPE IN A SPECIFIC SITUATION

- Therapist works with parents or teachers to redesign a daily routine, physical arrangement and daily time table.
- Goal is to immediately reduce stress in specific recurring situations.
- Activities may be introduced, eliminated, or modified to reduce stress and to support attention and motivation.
- Objects and materials, or space and time parameters, may be modified.
- Consideration given to child's sensory processing characteristics and needs.

10. CONSULTATION MODEL

- Education and suggestions provided to teachers, parents or others.
- Considerations: frequency, support, monitoring.
- Should not be expected to achieve the same goals as individual therapy.
- Usually involves environmental modifications.

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