**Adapting speech and language therapy to support children with a vision impairment**

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**Introduction**

Have you ever wondered why some children look away when they communicate with you? Or why some children do not appear to understand facial expressions? Have you come across children who find it difficult to match words on a visual display? Or children who have difficulties with social language skills despite excellent use of structural language? These are all common features in children with a vision impairment. Vision impairments resulting from eye conditions are usually known by the parents. However, visual processing difficulties, known as ‘cerebral visual impairment’ (CVI) are often not identified and therefore not understood by the parents. Furthermore, parents and professionals in the care of their children do not always realise the impact of vision impairment upon development, including acquisition of language and social skills. This article provides some insight into the role that vision plays in language development in children, and the potential for language learning difficulties in those with low or absent vision. It contains practical examples and advice on identifying visual issues and adapting the approach to support this group of children.

**Assessing milestones for language and literacy**

Language acquisition commences before the child is born and continues to develop after birth, increasing in complexity and vocabulary. An example of a developmental milestone for language acquisition is a child’s ability to point to pictures accurately, either when given a forced choice of two images or by finding a common object within a picture scene such as an apple in a fruit bowl, which is usually reached by the time they reach 6-9 months ¹. When assessing children’s linguistic milestones, one has to bear in mind that the use of visual representations of spoken words or concepts, rely on the child’s ability to locate, see clearly and interpret these images. For children with a visual difficulty, whether or not previously known by the parents, methods like these can confirm the presence of receptive language and vocabulary, but cannot confirm the absence of receptive language.

**Pragmatic versus structural language skills**

In the context of vision impairment, it is important to make a distinction between structural language skills and pragmatic language skills (see table 1). Visually driven joint experiences from early childhood play an important role in language and literacy development ³ and it is therefore not surprising that children with a vision impairment do not always acquire language in the same way as their sighted peers. Typically developing children tend to develop good structural language skills, but can struggle with social language development if the skills necessary to develop social language have not been modelled at an early age. When it comes to language development in children with complex needs, some of them develop language normally, while others do not develop language altogether and remain ‘non-verbal’. Here the distinction needs to be made between receptive language (or understanding) which may be evident, and expressive spoken language, which may be absent or limited.

Figure 1: Distinction between pragmatic and structural language skills in typically developing children, who use verbal communication ²

|  |  |  |
| --- | --- | --- |
|  | **Structural language** | **Pragmatic language and socio-communicative skills** |
| **Description** | Skills required to converse fluently | Using language socially and appropriately |
| **Examples** | -Grammar  -Syntax  -Articulation of speech  -Vocabulary | -Facial expressions  -Taking turns  -Gestures  -Eye contact |
| **In children with vision impairment from birth:**  **Pre-school age** | -At risk of delayed initial language development  -3x more likely to be diagnosed with speech and language disorder at the age of 3-5 years, compared to sighted peers ⁵ | |
| **In children with vision impairment from birth:**  **Start of primary school** | Normal or even better than their sighted peers | Less well developed than sighted peers if not managed appropriately |
| **Language patterns observed in children with visual impairment** | -Extensive and sometimes seemingly inappropriate questions  -Repetition of phrases or words without a meaningful context (echolalia)  -Lack of gestures accompanying speech  -Lack of eye contact | |

**The role of joint attention**

Joint attention is an important mechanism for developing social-communicative language and refers to an interaction whereby both parties take an active role and are fully engaged in the conversation either through speech or through actions and signs ³ ⁴. An example of joint attention is when a child is looking at an item of interest and then excitedly looks at their parent to check if they are also looking at it. When children get older, they might point to objects and ask their parents what the objects are. This requires the child to see or notice the objects in the first place. A vision impairment can therefore be a hindrance for developing social-communicative language skills. Before the role of vision in achieving joint attention is explained in more detail, let us consider some common conditions affecting vision and visual processing in childhood.

**Common conditions affecting vision and visual processing in childhood**

***Refractive error***

Refractive error is a common feature in children. Due to the effectiveness of pre-school vision screening programs, most children will have received a spectacle correction before they start school. However, not all children attend for their appointments and children with additional support needs are especially at risk of missing out on effective treatment of this condition ⁶. Additionally, refractive error can develop throughout childhood. Uncorrected refractive error results in blurred vision as the image is out of focus.

***Ocular alignment, muscle control and ‘lazy eyes’***

Ocular alignment issues (‘eye turns’) are common in young children and are often managed by wearing spectacles. Some children additionally require to wear an eye patch (when vision is significantly worse in one eye). Whilst the patch is on, the eye that is not being patched has reduced vision. Some children with an eye turn have restricted eye movements, which can in turn result in an adapted head posture.

***Ocular Albinism and nystagmus***

Children with this condition usually have reduced vision and tend to be more sensitive to light. They also tend to fixate with an area away from the centre, and therefore do not always seek direct eye contact. Additionally, some may develop nystagmus, a rapid involuntary movement of the eyes. Nystagmus can also occur as an isolated condition or associated with brain conditions.

***Retinal dystrophies***

Children with retinal dystrophies tend to have visual field loss, either in the centre or in the periphery. Their vision is reduced and they can be light sensitive.

***Cataracts***

Cataracts leads to hazy vision and is usually treated if it is significantly impairing vision. After cataract surgery, some children require significant spectacle correction.

***Glaucoma***

Children with this condition tend to have reduced vision and impaired visual fields

***Optic atrophy***

Depending on the severity, vision and visual fields may be mildly or severely reduced. Visual processing can be delayed and children may complain about light sensitivity.

***Cerebral Vision Impairment***

This is a complex condition which manifests itself in a range of visual difficulties. Examples are: Only seeing or noticing certain parts of the visual field, impaired overall vision, impaired ability to see contrast and colours, problems with visual attention, reduced visual processing speed, difficulties with movement perception, difficulties with visually-guided reach, impaired object, shape and face recognition, difficulties seeing/processing vision in a crowded or cluttered environment.

**Vision impairment and joint attention**

The key issue with respect to young children with a vision impairment learning language, is that everyone communicating with them needs to ensure that their language relates to the child’s experience and not to their own ⁷. Whilst joint attention occurs naturally in children with normal vision, this may not be the case in children with a vision impairment, whether or not this vision impairment has previously been identified. Speech and Language therapy needs to be adapted in children with compromised vision or visual processing. The following scenarios illustrate how speech and language therapists can look out for potential visual difficulties.

***Child is not engaging with visual representations of spoken words***

The first question to ask is whether or not the child is able to locate the object of interest. Reasons for not being able to locate the object are related to eye movement control, visual fields and visual attention. If a child is unable to control their gaze, they may not be able to access all the images on a communication board, or in a story book. Similarly, if a child has a visual field impairment, they may ignore the pictures on one side or on the bottom of the communication board or page, or they may not be able to see the person who is talking to them. In some cases, children are unable to identify specific objects within a crowded scene. In these scenarios, the child is more likely to engage if only one picture or object is shown at a time, within the child’s area of vision. A quiet work space with minimal clutter and minimal noise distraction can further support the child’s learning. Secondly, one needs to consider if the child is able to see the pictures clearly enough to identify what they represent. This may be compromised when the child’s vision is blurry due to uncorrected refractive error, or due to conditions of the eye or brain. In this case, the line-width of the images needs to be thick enough for the child to see. This can be achieved by tracing the pictures with a felt-tip pen, by moving the image closer, or by using magnification (prescribed by an eye care professional). Thirdly, the reason for not engaging with visual representations of spoken language could be that the child is unable to recognise images, symbols or shapes through the use of visual memory. In this case, the child needs to use other senses to explore the meaning of words, for example by giving the child objects to touch, smell and taste to experience the characteristic elements of objects and their function, at the same time using key words. For children who have poor vision, tactile reading books are a good source for developing literacy. One can also improve engagement with the story by talking with the child about the story being read, referred to as ‘dialogic reading’ ⁸.

***Child is using words or phrases out of context (sometimes referred to as stereotypical speech)***

When assessing and supporting children with stereotypical speech, it is worth investigating the reason for displaying this behaviour as this may affect the way this child needs to be managed. Consider a child with impaired vision or visual processing. Early literacy skills are often learned through observing and listening to role models, such as parents, siblings and teachers. If these role models speak as they normally would, assuming that the spoken word is accompanied by the visual scene around them, the child with a vision impairment may not be able to make sense of what they are talking about. As a result, the child with a vision impairment learns that meaningless words without a clear content are the norm and they copy this behaviour and naturally develop stereotypical speech. The key to successful language development is to use ‘radio language’, referenced to the experience of the visually impaired child whereby the person communicating provides an audio-description of the visual scene to provide meaningful context⁹. This way, the child learns that language has a meaningful purpose and is used to communicate information, concepts, thoughts and feelings.

***Child is not showing eye contact***

There can be different reasons for a child looking away when they are speaking with another person. Firstly, they may not see the other person’s face clearly. In some conditions, the central part of the visual field is poor and the child may see better when they look away from the centre. Some children have more stable vision when looking to the side, above or below the centre, for example due to eye movement control issues. Eye contact can also be lacking when the child does not understand the meaning of facial expressions or when the visual complexity of a face is too much to process when they are concentrating on the spoken word. It is not always in the best interest of the child to insist on making eye contact. However, it is important to understand why eye contact is lacking. For example, if the reason is ‘because the facial features are not seen clearly’, the person communicating with the child needs to establish at what distance the child can see their face so that communication takes place within the facial recognition distance. However, if a child looks away in order to see the other person’s facial features clearer due to central vision loss, the child would not benefit from being forced to fixate centrally as this worsens their ability to see the facial features clearly.

***Child does not pick up on facial emotions***

The obvious reason for not picking up on facial emotions is when faces are not seen clearly as described above. However, there are other reasons that need to be considered. For example, one needs to be aware of the fleeting nature of facial expressions. Some children, especially those who were born prematurely, before 30 weeks of gestation, have difficulties perceiving or processing rapid facial expressions. In order to help these children understand and label emotions, it is essential to prolong facial expressions, while using words to label the emotions they convey. Furthermore, parents need to label their child’s own emotions with single appropriate linguistic consistent labels such as, “you are happy”, or “you are sad“, when the child is either happy or sad. On a future occasion the parent might then be able to say ‘Mummy is sad that you are doing that’, while using a more prolonged sad facial expression. In this way, language is progressively being used to successfully substitute for the lack of being able to visually appreciate the emotions of others. This helps to build up theory of mind. Another reason for not understanding facial emotions or recognising people’s faces is developmental prosopagnosia, which refers to a specific face recognition problem due to impaired function of the face area in the fusiform gyrus in the temporal lobe ¹⁰.

***Child has difficulties with social interactions, relationships and developing theory of mind***

Theory of mind refers to an understanding that another person’s perspective in terms of beliefs, emotions and thoughts may be different from their own. This is an important contribution to building relationships with others. When facial expressions are not seen due to significant vision impairment, theory of mind can be taught by regularly putting words to a child’s emotions as they happen. Once the child has become able to understand these words, in relation to their own state of mind, the parent can use these words to describe their own emotions and those of other people. When the words are accompanied by appropriate body language and evident facial expressions (within the facial recognition distance) and inflection, the child gradually learns to tune in to other people’s emotions, despite not being able to appreciate the language of facial expression.

**Case examples of children attending the vision impairment clinic**

The author has taken an interest in language development in children with a vision impairment as a result of observations in her clinical practice and reflecting upon these observations. The following case example illustrates a typical scenario.

**Case study 1:**

***Observation***

This case involves a nine year old boy with nystagmus (involuntary eye movements). His vision after spectacle correction is moderately reduced due to his nystagmus. His eye movements intensify when he is looking up or to either side. His parents share that he did not speak until he was about 3 years old, he struggles in social environments and he tends to look down when spoken to. The child is under investigation for Autism. He is able to read and write at a lower than expected level. His reading speed is slow and his teacher reports that his ability and interest in reading has regressed in recent months. In clinic, he asks a lot of questions and repeats phrases which appear to be out of context.

***Recognising faces and facial expressions and lack of eye contact***

Developing social language skills can be supported by ensuring that communication takes place within the facial recognition distance. For this boy, the facial recognition distance varies, depending on where he is looking: With intensified eye movements in up-gaze, his vision is likely to be worse in this position and therefore, communication needs to take place at eye level and close-up (the exact distance needs to be identified). If interaction has not consistently taken place at the appropriate distance from a young age, the child would not have had the opportunity to learn the meaning of facial expressions. This may have contributed to the lack of sustained eye contact too.

***Repetitive questioning, stereotypical speech and social interactions***

As explained in the section about joint attention, this child has developed these speech patterns as a result of his visual difficulties. It is therefore important to compensate for his reduced vision when undertaking speech and language therapy.

***Reading and writing***

If a child is asked to read books in a print size close to their threshold print size, this is akin to asking a normally-sighted person to read a book in the tiny print size which is typically used for medicine leaflets. One needs the print to be 2-3 times larger than threshold for sustained reading. Once a child has learned the basics of reading and writing, they tend to read from well designed reading books with large print and clear pictures. As they advance, the print size and pictures become smaller and the text becomes more crowded. It is therefore common for children to regress when the text presentation becomes too challenging owing to print crowding and reduced font size. At this point the child needs to be supported through visual impairment services in order to get appropriate magnification aids or adapted school resources to facilitate learning.

Whilst it is never too late to learn, it is best to support families at an early stage to facilitate learning and development. The following case study concerns a baby who visited the author’s clinic recently.

**Case study 2:**

***Observations***

This case concerns a baby aged 9 months with severely reduced vision related to brain damage. She was only able to see large objects (8cm or bigger) or faces at close distance (20cm). Her eye movement control was poor and her only area of vision was centrally and in the upper left corner. She responded better to moving objects than to stationary ones.

***Creating an optimal environment***

Children with CVI often respond best to visual stimuli when the learning environment is uncluttered (McDowell)¹¹. The use of a tent is an effective way to eliminate distractions from visual clutter and noise and is recommended as an effective learning environment for children with (profound) visual impairment (Little; Dutton)¹² ¹³. Table 1 lists some ideas for creating an optimal environment for the child.

***Getting ready to chat***

For successful play and interaction, parents need to understand what the child can see and what their limitations are. To attract attention, the parents were advised to use sound and touch and to move in front of the child, or off centre right side, or to present objects and toys within this field of vision. They were also advised to use large bright objects and toys with moving elements to ensure that the child would be able to see them. In order to learn from facial expressions, the parents needed to engage with their child within 20cm distance.

***Meaningful interactions***

The parents were aware that their daughter needed plenty of time to process vision and speech and that interaction had to take place at her pace. The child was unable to process sight and touch simultaneously and therefore, it worked best when the parents placed objects in the child’s hand for her to explore before using a word to describe the object. Table 2 contains a list of strategies which were discussed with the parents, to support her language development. A couple of weeks after the consultation, the parents shared that their daughter had spoken her first words!

Table 1: Creating an optimal environment for learning and development for babies and toddlers

|  |  |
| --- | --- |
| **Minimise clutter** | Minimalistic, comfortable space with familiar items |
| **Minimise patterns** | Plain surfaces and furnishings |
| **Contrast** | - Bright colours and high contrast toys and objects  - Tactile bright-coloured stickers  - Bright tape for door frames |
| **Lighting** | Up-lighting/ avoid direct focal lights |
| **Storage** | Toys/utensils/everyday objects in consistent, easily reachable places for the child |

Table 2: Strategies for language development in children with a visual impairment

|  |  |
| --- | --- |
| **Using all the senses** | - Talk about what you can see your child is giving attention to, and help them reinforce the nature of the experiences by using their other senses too - One thing at a time: Attract attention, give an item to the child to explore by touch, then use the word to label it. (The key is to build up experiences sequentially, in order to give and reinforce meaning). |
| **Getting ready to chat** | - Put away your phone and switch off other devices/TV- Avoid using a dummy, except for nap time - Speak in your native language - To enhance facial features and facial expressions, consider using red lip stick and dark-rimmed glasses, while fathers can grow a moustache to give contrast to the moving upper margin of the mouth - Wear plain clothes to minimise distraction |
| **Listening and connecting** | - Position yourself at your child’s eye level, or within their best area of vision to attract and maintain attention - Listen, watch, wait and respond - Use a gentle voice and smile at your child - Gradually slow your voice until attention is gained, then use this speed to continue. - Pay attention to your child’s facial expressions, sounds and little movements - Copy your child’s gestures and sounds to show that you’re listening, and to give them space to respond - Describe your feelings to your child, using words you know that they already know, as your child might not pick up on facial expressions or gestures |
| **Singing and making noises** | - Have fun playing with sounds (eg blowing raspberries) - Copy/Mirror sounds that your child makes - If their sounds have meaning and are close to the right sound, ‘reply’ using this right sound - Sing songs to calm your child and teach familiar routines (eg a ‘tidy up song’, a ‘meal time song’ or a ‘bed time song’). Accompany the songs with actions - Read books with your child and use sound effects and/or objects to illustrate your story - When reading books, chat with your child about the story - Talk about the stories you read to place them in relevant context - Use a marker pen to highlight essential features in picture books (eg make the eyes bigger) - Choose books with pictures which your child can see, so the story makes sense |
| **Language learning as part of daily routines** | - Sing and speak as part of daily routines, such as dinner time, bath time and nappy time - Consistency and repetition are key |
| **Have fun** | - Children learn best when they are happy |

**Conclusion**

Language development, and in particular the social use of language, is largely visually-driven. Speech and language therapists are in a unique position to identify potential visual difficulties in children who display particular behaviours and speech patterns. When the visual difficulties are understood and appropriate strategies are applied, this can lead to better outcomes for the child’s social development and linguistic skills.

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