Vocal Behavior in Preschool Children

Essay

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List of Abbreviations

APA	:	Auditory perceptual assessment
Fo	:	Fundamental frequency
GE	:	Glottal Efficiency
GERD	:	Gastro-esophageal Reflux Disease
GR	:	Glottal Resistance
HNR	:	Harmonic signal to Noise Ratio
HPT	:	Highest Physiological Tone
LPT	:	Lowest Physiological Tone
MAPLs	:	Minimal Associated Pathological Lesions
MFR	:	Mean Flow Rate
MPT	:	Maximum Phonation Time
PQ	:	Phonation Quotient
Psub	:	Subglottic Pressure
RRP	:	Recurrent Respiratory Papillomatosis
pVHI	:	Pediatric Voice Handicap Index
SPL	:	Sound Pressure Level
VC	:	Vital capacity
VKG	:	Videokymography
VRP	:	Voice Range Profile

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Introduction

Voice alterations in the childhood interfere in a negative manner with the social performance or even affective-emotional development of any child.

Dysphonia is conceptualized as a weakening of all vocal parameters, which presents several modifications in the sound quality, the sound expression, pitch and intensity ***(Hirschberg et al., 1995).***

Kotby (1995) defined dysphonia as perceptual audible change of a patient's habitual voice as self judged, or by his or her listeners. Dysphonic voice can also be defined as that voice that fails to meet a patient's vocal demands, personality, age, or gender.

Dysphonia is a common symptom in children, and has diverse etiology, by varying from alterations onto the functioning of phonoarticulatory organs up to incapacitating lesions with risk of life ***(Freitas et al., 2000).***

The incidence of dysphonia in preschool children varies from 6% to 23.4%, with a peak between five and ten years of age, but it is not uncommon to find three-year-old children with a diagnosis of vocal fold nodules ***(Melo et al., 2001)***.

Dysphonia in preschool children prevalence per gender, studies state there is no significant difference between boys and girls ***(Melo et al., 2001)***. Most researchers remark a higher occurrence of such vocal alteration in male children, which is justified by the social demand of more aggressive behavior ***(Silverman and Zimmer, 1975)***.

The characterization of vocal habits present in the childhood contributes for the analysis of the possible maintaining causes and factors that may relate to vocal alterations. In the day nurseries, the children present with many opportunities to commit vocal abuses that lead to laryngeal disorders as ***(Simoes et al., 2002)***:

1. Exposure to noises that lead to vocal competition.
2. Dust leading to dryness of the vocal tract.
3. Inadequate standard of educators which result in a negative vocal model.
4. Participation in free air activities where the vocal self control becomes difficult.

The predisposing and aggravating factors of dysphonia in preschool children may be grouped into five categories ***(Melo et al., 2001)***:

1. Inadequate vocal habits
2. Physical and psychological factors.
3. Personality structure.
4. Phonic inadequacy.
5. Allergic factors.

Vocal abuse involves the incorrect use of the vocal tract, that eventually causes harm to the vocal folds. Another factor in children developing dysphonia is vocal misuse in which children speak on the wrong pitch or loudness level.

Speaking with a loud voice especially in noisy environments in order to making oneself heard demands some vocal effort and has been shown to harm the voice on the long run, in the form of some changes in the vocal folds that can lead to phonation problems (problems activating and sustaining one's voice), in the form of:

1. **Non- Organic voice disorders:**
    - Hyperfunctional Childhood Dysphonia.
    - Hypofunctional Dysphonia.
2. **Minimal associated pathological lesions (MAPLs):**
    - Vocal Fold Nodules "Juvenile type".
    - Vocal Fold Polyps.
    - Vocal fold cyst.

Dysphonia may adversely impact a child's general health, communicative effectiveness, social and educational development, self-esteem, self- image and participation in school group activities ***(Ruscello et al., 1988)***.

Early diagnosis is important when a child presents with a voice problem. Voice changes accompanied by laryngeal stridor prompts concern that the child may have a potentially serious laryngeal disease, such as congenital laryngeal web, congenital cysts, subglottic stenosis, recurrent respiratory papillomatosis (RRP) or vocal fold paralysis ***(Hersan and Behlau, 2000)***.

Hyperfunctional childhood dysphonia is one of the most common non- organic voice disorders in children which are typically seen in children who are misusing or abusing their voice. This condition is evidenced equally in both sexes. The child with hyperfunctional childhood dysphonia has, however, no subjective complaint except for "dysphonic voice" ***(Andrews, 1999)***.

On laryngeal examination cases may only show increased vascular markings, slight diffuse swelling of the vocal folds, and hour glass phonatory waste ***(Berkowitz, 1996)***.

The approach for diagnosis and management of dysphonia in children must be multidisciplinary ***(McMurray, 2000)***. Evaluation of children with voice problems differ from that in adults in several aspects. Children have limited ability to cooperate, therefore, any assessment techniques must be done for children with at least invasive manner. Parents, family members and other caregivers are also included in the acquisition of historical information and should be involved in therapy. The assessment of voice problems requires a comprehensive medical and behavioral evaluation. It includes multidisciplinary team (Otolaryngology-head and neck surgery, phoniatrics, logopedics, pediatrics, psychology, neurology, genetics, endocrinology ***(Morrison et al., 1995).***

Treatment of voice disorder has certain goals which are ***(Kotby, 1995)****:*

1. Restoring the structural integrity of the vocal folds.
2. Readjusting a faulty vocal behavior.
3. To develop the best possible voice quality based on the physical status of the larynx.
4. To develop appropriate respiratory support.

Organic lesions may require medical or surgical treatment. In many patients (mainly the non organic voice disorders), initial treatment will be behavioral readjustment voice therapy. In general the management of voice disorders includes pharmacotherapy, behavioral readjustment voice therapy including (voice hygiene advice, family counseling and voice therapy) and phonosurgery ***(Clary et al., 1996)***.

Aim of the Work

The aim of this work is to describe the vocal behavior in preschool children in order to determine the effective methods of assessment and management to prevent their negative impact on children's vocal folds, social interaction, communicative effectiveness, and scholastic achievement.

Etiology of Voice Abuse in Preschool Children

Etiology of voice abuse

- ***Incidence of childhood dysphonia:***

According to ***Hirschberg (1999)***, most of the children outgrow dysphonia after puberty, 15% of chronically dysphonic children will continue to have abnormal vocal quality**.** Voice disorder is frequent among children, although statistical data give a wide variety of their incidence (6% – 23.4%) which is obviously due to the different criteria of the surveys; the overall prevalence of dysphonia in a statistically representative sample was 14%. The ratio between boys and girls has varied between 3:1. The incidence of hyperfunctional childhood dysphonia is 38% to 78% of dysphonic children.

- ***Etiology of abusive vocal behaviors can be classified into (Boone and Mcfarlane, 2000):***
  1. **Talking and singing in excess,** for example in a nursery play, concert; shouting in the playground against background noise; overusing the voice when sick; cheerleading; overusing voice when emotionally upset or tired.

2. **Glottal attack**, use of forceful voice can really damage vocal folds.
3. **Coughing and loud forceful sneezing**, children who do not rest voice when they have sore throat, asthma, or post nasal drip.
4. **Crying, laughing, loud and long outbursts of emotions**, tantrums, inability to cope properly with negative emotions, related to loud, forceful use of voice.
5. **Grunting**, during sports activity, this puts a sudden shock to the vocal folds.
6. **Throat clearing**, vocal folds are slammed together every time the throat is cleared.
7. **Making sound effects or character voices**, especially when breathing, this puts more strain on the vocal folds.
8. **Dryness**, caused by overuse of certain medicines (cough drops and antihistamines), allergies, and mouth breathing.
9. **Restricted fluid intake**, for healthy vocal system; good hydration is necessary.

- ***Children at risk for voice disorders may have one or more of the following:***

1. Families with loud voice habits.

2. Chronic asthma or allergies.