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Content

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Editorial

Indian Journal of Growth, Development and Behavioral Pediatrics has come a long way and is now creditably established. In the past we have always had special issues based on one particular topic, be it growth, development or behavioral pediatrics. This time we have chosen a mixed bag of topics for the issue.

Developmental delay, which is a common problem, faced by the primary care pediatrician, needs appropriate assessment. We have given a guideline on approach to developmental delay.

Other problems like sleep disorders and academic under achievement needs to be dealt with by primary care pediatricians. It is important to know the important aspects of quick assessment and when and where to make appropriate referrals. The role of electronic media needs to be reviewed and check guidelines need to be set.

We also encourage and request you to send in your writings to share your experiences. This way we may disseminate the knowledge to fellow colleagues in our country, and get enriched in our knowledge.

Monidipa Banerjee
Editor of this Issue

About the Editor of this Issue

Monidipa Banerjee

Dr Monidipa Banerjee graduated from Kolkata in 1988. She subsequently underwent training in General Medicine and Paediatrics. She completed an one year diploma in Tropical Medicine and Hygiene.

She went to the UK to obtain higher training in Pediatrics and Neonatology in 1996. She obtained the Membership of the Royal College of Pediatrics and Child Health and DCH from London. She worked as a Pediatric Registrar and obtained advanced training in Neurodevelopmental Medicine. She attended several courses in the UK, including Child surveillance course, Assessment and management of children with physical disabilities, Developmental assessment, and Total Communications Course at the Co-ordinators level.

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Electronic Media and Children Behavior

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Introduction

We are all the product of mass media culture. We live in a sea of mediated communication. Less in global village than a vast bazaar of messages, we are more in contact with the thoughts and intentions of others than at any other time in history.

The world of electronic media is changing dramatically. television dominated the media world through 1990-2000, now competes in an arena crowded with cell phones, I pods, video games, instant messaging, interactive multiplayer video games, virtual reality sites, web social networks and email. In India 30 crores people directly use media. More than 17,000 crores rupees are collected through advertisements. There are 2130 dailies and more than 100 channels.

The vast majority of children have access to multiple media. A teen can watch a television show on a computer long after has aired on. They have almost constant access to media often at times and in places where adult supervision is absent.

A typical child watches 15,000 to 18,000 hours of television by age of 18 years compared with attending 12,000 hours of school. They spend more time using media than do engaging in any single activity other than sleeping. Television viewing has become the Indian drug of choice.

Media History

Taking media history should be important part of history taking by pediatrician. It should include how many hours to which media and under what conditions, content of program, selection criterion, and supervision by adult, v chip, other leisure time activities, inference discussion, nutritional history. The most important is supervision by parents and content. Media is used as a third parent or servant is very important as both parents are working mother in kitchen and father in reading or out for his work and the child is having remote in his hand and doesn't know how to select the programs and watch only movies or cartoons. Hence the remote control is in which hand is very important.

Our own survey of 1263 students from different socioeconomic class and different educational background of parents shows: 79% of parents and children perceived TV as a media for entertainment while 84% children and parents watch TV for 2 hours. Remote control of TV is family discussion (49%)

and father (34%). Rule for viewing TV is after studies by 45% of the parents. 78% of parents and 85% of children did not watch TV after 10pm. Parents blamed TV (51%) for the behavioral problems important being stubborn (21%) sleep problems 20% and imitating stars 16%. The programs blamed for behavioral problems are movie 29%; Horror shows 20%, and songs 20%. 50% parents have more than two cell phones in their house. Sending sms or email jokes contribute 36% while creative messages 41%. Majority children take breakfast in front of TV (45%) while 22% eats fast food and potato chips. Favorite media of the parents (40%) is TV and internet was preferred media of children (35%). The best alternatives for electronic media are sports 31%, parental interaction and story book 20 % each.

We also noted difference in English and Marathi medium students attitude. Perception of television as entertainment is more with English than Marathi medium. Habit of taking meal is independent of medium. In English medium as age advances instead of sports serial and movies were preferred. In both medium duration of child watching TV is same as parents hence parents must be careful about that. As an alternative to media English medium students preferred sports while Marathi medium students preferred parental interaction.

The conclusion of studies show that the electronic media has great effect on children's behavior.

Trends in media use :

It is important to distinguish between media use and media exposure. Media use refers to the amount of time young people devote to all media.

Media exposure :

Refers to media content encountered by young people expressed in units of time that is hours of TV exposure.

Total media exposure, media multitasking has been increased but total use remained relatively constant and there is little evidence that any medium especially Television is being displaced. Children's simultaneous use of different media or media multitasking is very common. Television in a background child uses computer or cell phone for instant messages. Computer is "Media multi tasking station". Cell phones can be a television and internet portal and radio all in one. Both opportunity and environment plays an important role in concurrent media use. Girls report more concurrent media exposure than boys.

***Neurodevelopment and learning*:**

There is growing literature about impact of electronic media exposure on attention, memory, executive functions, language and communications, visual-spatial processing, reasoning and social and emotional functioning. Impact depends on age and content of the media. The impact of television on visual

processing and language appears to be neutral.

Media technology can be used effectively as a teaching tool in school but the results depend on how teachers use the technology and their own comfort level with the media. Unlike the phonologic code of written language visual mass media do not require training in a formal notational system. Children with learning disability watch more television then peers, have more difficulty in distinguishing fiction from reality and have difficulty with drawing inferences and narrative continuity.

Transfer of learning from TV is possible if he (i) must understand content, (ii) must create an abstract, (iii) must remember the content and see its relation to new problem, (iv) must apply the remember content to the new problem.

Addiction of television :

It can be identified as follows : (i) using TV as a sedative, (ii) indiscriminate viewing, (iii) loss of control while viewing, (iv) feeling angry with one self for watching too much, (v) inability to stop watching, (vi) feeling miserable when kept away from watching.

***Age related media*:**

Children learn through observation. Infants and toddlers needs direct experience and more interaction with real people to develop cognitively hence they do not learn by electronic media. By the age of 3 years electronic media with educational content that uses repeating an idea presenting images and sounds can capture attention. 5 yrs children learn more words than 3 yrs children from media.

Background TV interferes with toddlers ability to focus on play they do not begin to discriminate between TV and real life events until preschool years. Socio demographic factors like income, education may not affect children's viewing until late in childhood.

Children's ability to attend to television increases until about 9 years, when is reaches about 70 % of viewing time, attention to television appears to be closely related to the child's understanding of the content. Content if designed correctly can enhance learning.

Teen agars spread their lives immersed in electronic media. While doing homework on internet they do instant messaging to their friends and television on background they are listening to music on ipod.

Media and emotional development :
Screen media plays crucial role in children's emotional development. They learn ability to recognize emotions in others, feel empathy or share emotions with others.

***Media and behavior*:**

Electronic media can positively influence social behavior, knowledge and understanding. It can be accused of increasing aggression and having negative effects on learning. It is endless

source advertising, portrayals of violence and opportunities for dangerous encounters with strangers and possible exposures to pornography.

Family TV diary, maternal employment, education, older sibling in the family influence educational programs. Heavy media use become recognized as a possible symptom of personal maladjustment.

***Attention, cognition and school achievement*:**

More is not necessarily better . An academic achievement of children peaks at 1-2 hours of educational programming and declines with heavier use (more than 4 hours). There is significant negative link between grades and media exposure. Playing video games can have positive effects in developing visual spatial skills such as visual tracking, mental rotation and target localization. Gaming may also improve problem solving skills. There is inconsistent evidence of link between heavy electronic media use and ADHD. High doses of entertainment before 3 years of age gives rise to attention problems 5 years later. The children learn the things we teach them.

Children cannot learn from educational messages to which they do not pay attention. For maximizing attention to program cuts between shots, camera, sound effects child's voice etc. are the technique used by the producer. It also depends on comprehension, repetition, viewer characteristics and transfer of learning.

Edutainment seek to instruct its audience by embedding lessons in some familiar form of entertainment like TV programs, computer and video games.

***Sleep*:**

The presence of a television set in the child's bedroom may be a relatively under recognized, but important, contributor to sleep problems in school children. Why parents have bedroom T.V for children because it frees them up, they can watch own shows, it keeps children occupied but such watching becomes an isolated experience and that is harmful for developmental and there is risk for sleep disorders. The children having television set in bedroom watches one hour more than average. Bedroom television is linked to number of poor outcomes including academic, social and physical activity. Teenagers' use of Cell phones after bedtime contributes to poor sleep.

***Aggression, fear, violence*:**

Content of some entertainment and news can instill fear and anxiety in children. Children between ages 3-8 years are frightened by fantasy characters. Older children are affected by realistic scenes of injury of violence.

Media violence exposure has a larger effect on later violent behavior than does substance use, abusive parents, poverty, living in a broken home or

having low IQ. Media have a powerful influence on health and behavior. Girls experience more fear from media than boys as they get older.

Media violence is a risk factor for aggressive behavior but is not related to crime.

Risky behavior and sexual problems:

Society's traditional adolescent issues intimacy, sexuality and identity have all been transformed by electronic media. Transformations is also due to greater teen autonomy, decrease face to face communication, increase peer group relations in expense of family relations and greater teen choice. Five critical types of adolescent health risk behavior identified obesity, smoking, drinking, sexual risk taking and violence.

Exposure to sexual content in music, movies, television, and magazines accelerates adolescents' sexual activity and increases their risk of engaging in early sexual intercourse. The media should be encouraged to provide more sexually healthy content.

Willingness model for risky behavior has two pathways one that is reasoned and the other is spontaneous and opportunistic. Reaction to favorable social circumstances rather than planned are seen.

Nutrition, obesity:

Television consumption has clear relationship to obesity. A couch Potato by definition expands very little energy . Even doing nothing uses up more calories than watching television. The second mechanism that links is the change in eating habits. The role model actors endorsing high calorie products cannot be under estimated. An increased consumption of sweets, salted snacks and artificially sweetened drinks, bhajias and chiwadas and less in take of vegetables and fruits. Obesity is also related with amount of time spent in front of television and eating meals in front of television.

Eating right and being healthy is as easy as 5-4-3-2-1 go.

5. or more fruits and vegetables

4. Servings of water

3. Servings of low fat dairy

2. spend no more than 2 hours per days on watching T.V. or similar activity

1. At least one hour of physical activity a day.

Social marketing and campaign:

Campaigns to present and control tobacco use, increase physical activity, improve nutrition and promote condom use are example of successful social marketing.

Social marketing has also been used to promote better parent child communication and improved family health. It can also provide children and adolescent with reason an opportunities to engage in healthful alternatives by demonstrating behavioral alternatives that tap into there wants and needs.

***Child as a consumer*:**

Advertising and product placement for cigarettes and alcohol as well as exposure to movie character smoking and drinking has increased under age drinking and initiation of smoking. Marketing practices such as repetition, branded environment and free prizes recognition and retention are effective in attracting children attention.

4Ps of marketing – Product , place, price and promotions. They use public presentations to influence consumer's attention. Stealth advertising in which marketers attempt to conceal the intent of advertisement.

Negative outcome of advertisement – parent child conflict, cynicism, obesity and materialistic attitudes. To reduce children request using power assertion (restrictive mediations) and reasoning (active mediation), no information (co viewing) is necessary.

***Media policy, role of media literacy**:*

Children spend with media, parents and policy makers needs to focus on what is being offered to children on the various media platforms. Rating of programs for all media, regulation of advertisements is necessary. The programs should be more pro social. Media policy should contribute to positive role in developing in child's life.

Media literacy training involves school based efforts to teach children to understand media conventions, such as advertisement technique. (i) transition between advertisement and program content must be distinct, (ii) hot selling is not allowed, (iii) product being sold cannot be integrated into program content .

AAP Recommendation

1. Be alert to the shows your children see.
2. Avoid using television, videos, or video games as a baby-sitter. Simply turning the sets off is not nearly as effective as planning some other fun activity with the family.
3. Limit the use of media. Television use must be limited to no more than 1or2 quality hours per day. Set situation limits too: no television or video games before school, during daytime hours, during meals, or before homework can be implemented.
4. Keep television and video player machines out of your children's bedrooms.
5. Turn the television off during mealtimes.
6. Turn television on only when there is something specific you have decided is worth watching. Don't turn the TV on "to see if there's something on."
7. Don't make the TV the focal point of the house.
8. Be active – talk and make connections with your children while the program is on.

9. Be especially careful of viewing just before bedtime. Emotion-invoking images may linger and intrude into sleep.
10. BE explicit with children about your guidelines for appropriate movie viewing and review proposed movie choices in advances.
11. Become "Media literate."
12. Limit your own television viewing. Set a good example be careful when children are around and may observe material from "your" program.
13. Let your voice be heard to insist on better programming for our children.

Key Messages

1. Children spend more time using media than do engaging in any single activity other than sleeping.
2. Taking media history and identify the addiction should be important part of history taking by pediatrician.
3. Children's simultaneous use of different media or media multitasking is very common. Computer and cell phone is "Media multi tasking station".
4. Television use must be limited to no more than 1or 2 quality hours per day. The most important is supervision by parents and content. The medium is the message. Content matters.
5. Media technology can be used effectively as a teaching tool in school. Playing video games can have positive effects in developing visual spatial skills.
6. Avoid using television, videos, or video games as a baby-sitter, use it as a third parent.
7. Media violence is a risk factor for aggressive behavior but is not related to crime.
8. Media use: its cool but don't let it rule (your life)
9. Television consumption has clear relationship to obesity.
10. To control tobacco use, increase physical activity, improve nutrition and promote condom use are examples of successful social marketing .
11. Media policy should contribute to positive role in developing in child's life.
12. Work ahead is to discover what is beneficial, for whom it is beneficial, and when it is beneficia.

School Failure in Children

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Success or failure in school has far reaching consequences for the child. Numerous studies document how failing in school puts you at risk for many high risk behaviors and negative outcomes in terms of employment, health, mental illness etc. No wonder then, that for pediatricians today it is as important an issue as any other public health concern which has reached epidemic proportions.

Being successful in school has many components. To many, the phrase "school success" implies academic success. Yet to most of us, when asked to recall schooldays it is the friendships, bullying and other peer relationships, relationships with teachers, success in sports or other extracurricular activities which stand out as highlights of that time. To understand what contributes to school success or failure, it is important to understand the ecosystem which supports the child during school years.

For the school aged child, the 'developmental task' as described by Erikson, is peer acceptance. To be like his peers or to experience success as witnessed by his peers is of paramount importance to the school aged child. No child wants to be a failure. Therefore to label a child as lazy is to admit that you don't understand or don't want to try to understand him.

Let us first examine the home – the place where the foundations of school success are laid. Children, who come from low socio economic strata, have less exposure to language and books. No wonder that there is a stark disparity between the vocabulary of these children and those in middle class or upper class homes at the time of school entry. This clearly puts them at a disadvantage when it comes to literacy and academic achievement. Add to the above the fact that many parents from vernacular speaking homes want to (justifiably) make sure their children are exposed to English, and therefore have access to better opportunities in life. The result is a child who is doubly disadvantaged in school – having a poorer vocabulary to begin with, and having to deal with learning in a language that is his 2nd or 3rd language and is not spoken in his environment.

Even in homes where the language or socioeconomic status is not an issue, it is not unusual to meet families where there is a discrepancy between parental expectations and the child's potential and achievement. Other factors in the home may impact the child's mental

health and therefore his school performance. For instance an acute stressful event such as a death or a divorce often leads to poor academic outcomes. Little wonder then that children who are exposed to chronic stressful events such as child abuse or domestic violence are at high risk for school failure.

Next let us examine our school system. Most of us know through direct experience and need no data to convince us that schools in India are understaffed, have unmanageable student teacher ratios, have poorly trained teachers and that curricula are often rote intensive and rarely child centric. There is a lot of data to suggest that reading failure can be prevented by systematically teaching phonological awareness. A recent study suggests that competence in math, in addition to good language and prelitracy skills is a predictor of academic success in school. Yet, it is unclear how much of this research has been translated into action in our classrooms. It really becomes a question of whether children are failing school or whether our schools are failing the children.

As pediatrician though, the expectation of most families is that we will identify what is "wrong" with the child and fix him. A starting point may be looking at medical issues which contribute to school failure. Indeed any chronic illness may cause school absenteeism and therefore affect performance, for instance poorly controlled asthma. It is important to screen for anemia as it can cause poor concentration. Chronic sleep deprivation either due to sleep apnea, or due to excessive TV viewing may contribute to daytime sleepiness and poor attention. Medications which cause changes in behavior such as anticonvulsants , or those which cause daytime sleepiness like anti-histaminic may cause changes in school performance. Less commonly absence seizures, may affect performance. Lastly screening for vision and hearing should be part of the physical examination.

Developmental issues in the child come next. It is difficult in a busy practice to screen for LD, ADHD and borderline intelligence as a cause for school failure. Yet it is the pediatrician who has knowledge of the child's milestones, and temperament , in addition to knowing the family context. When such concerns are raised at a routine visit schedule a separate time to discuss these issues, requesting them to bring along report cards, school works etc. The actual visit should include a separate parent and child interview. It is important to understand the child's viewpoint on what makes school performance difficult for him , and the impact the school failure has had on his self esteem and mental health. Family history for developmental concerns and mental health concerns also need to be screened for.

Mental health issues may be co-morbid or exist independently with

developmental issues. Underlying issues may range from separation anxiety to bullying as a cause of school refusal. Childhood depression and anxiety need to be looked for , particularly in children with developmental concerns.

In summary , multiple factors contribute to school success and failure. Primary care pediatricians are in a perfect position to be the diagnosticians and coordinators of care for children with school failure. Playing an active role in liasing with the family school and community is an integral part of care . the role of the pediatrician as an advocate for the child in all these settings can not be overemphasized.

Learning Disability In Perspective

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A specific learning disability is a disorder in one or more of the basic processes involved in understanding or in using written or spoken language. A specific learning disability shows itself in the child's ability to listen, think, speak, read, write, or to do mathematical problems. This term includes children who have talking and listening problems. They have trouble finding the right words to talk about their ideas and/or hear other people saying words, but not understanding what the words mean. Children with LD may have trouble paying attention. They may have many ideas in their heads at once and cannot distinguish one from the other. Some children with LD may move slowly and have difficulty holding a pencil or crayon, thus making their work messy. A few children with LD have trouble understanding how other people are feeling. Children with LD do not include children who have learning problems that are primarily the result of visual, hearing or motor disabilities; of mental retardation; of emotional disturbance; or of environmental, cultural or economic disadvantage.

Family members of children with learning disabilities can help by gearing their interaction or instruction to the child's ability level and by modifying, when necessary, the tasks to be completed. They can plan sequential learning tasks (what to do first second, third, etc.), provide order in his or her space and simplify the task to be learned by the child. Breaking the task down into specific things that need to be done and listing them in the order that they need to be completed can do this.

There needs to be a place for everything in the child's room. Limiting the number of items makes it easier to have a cleared place where each thing can be put away. Shelves are often preferable to drawers because children can see their things in their proper places, rather than having to visualize what's in a drawer.

Structure can be introduced into children's time by making them fully familiar with the parts of each of their usual routines—what comes first, next, and last. Be consistent with routines.

It is obvious that all children need as much positive reinforcement for their good efforts as they can get. They need to be rewarded with praise, a gesture, or some form of approval whenever they succeed. But even the best of parents cannot maintain the self-esteem of children who have failed again and again in school, in the neighborhood, or on the

athletic field. Often a tutor, a special class, or a special school is necessary to provide the help needed to make these children feel good about themselves, to show them that they are capable of doing something about themselves – that they are the master of their own destinies.

Parents can work with these children in short periods of five-to-fifteen minutes, with a change of activity in between. They can help them make sense of their surroundings by talking about what they see and hear and help them express their ideas in nonverbal terms such as gestures, dramatics, and writing. All communication and learning activities need to be geared to the individual child's ability.

It is best that parents of children with LD try not to dwell on the future in their own minds. You can plan realistically for today, tomorrow, next week or even a few months ahead. But it is unrealistic to become overly concerned with the long-range future of a young child. There is too little knowledge, too many variables, and too many unknown factors for this kind of reflection to be in any way useful.

It is vital for parents of children with learning disabilities to develop their sense of humor in every way they know how. Laughter helps overcome many hurdles, and it gives children an extremely important unspoken message: Life is basically sunny despite all our difficulties. Funny things can be found in many situations, even though they are sometimes hard to see. When the whole family can see the humor in some of the experiences they go through together, it's really worth it.

Brothers and sisters of a child with a learning disability may exhibit intense negative emotions and feelings that they themselves may resent at times. Every child wants a perfect brother or sister of whom they can be proud. Just as neighbors and others blame parents for unacceptable behavior of their child who has learning disabilities, their peers often hold siblings responsible. A child may feel very resentful at being labeled "Weirdo's sister," or at having a child they scarcely know come up and say, "Hey, do you know what your brother did?" or "Is your sister dumb or something? She can't read." Children can be very cruel to each other sometimes.

Siblings may feel put-upon when they are urged to include the child with the learning disability in their play and their free time activities. This child may have few friends of his or her own and it is natural for parents to seek occasional relief, to expect the cooperation and a sharing of responsibility from their other children. But there are irritations—"He can be such a drag to take along." They have to watch him every minute to see he doesn't hurt himself, destroy someone else's possessions, or disappear. He wrecks any hope of making new friends that day. They can't go far or move fast.

Siblings may feel mean and guilty for feeling this way because they really do love their brother or sister. They care deeply in spite of the irritations. It's a rare family whose siblings are not more than understanding at times and don't come through in emergencies. Parents can't expect more. Children need support and assistance to be able to come to terms with the problem the same way their parent's do.

In the end, what really count are human qualities. A person's sense of himself, his feeling of comfort with himself, and thus his ease with others are what matters. How many adults do you know whose handwriting, or spelling, or memory of historical facts makes any difference to you? The chances are you want to be with a person who is fun and caring. You want a friend who laughs with you, not at you, who can share your worries as well as your pleasures. You want someone you can count on, whose word is good, who comes through on promises, and who doesn't keep score on favors given and received. The crucial roles in our society are being a good friend, a fine mate and a good parent. These are roles the child with learning disabilities can fulfill in adult life.

'The decisive question is not what methods or procedures are employed, or whether they are old-fashioned or modern, time-tested or experimental, conventional or progressive…the ultimate criterion for success in teaching is…RESULTS!!!'

Source

Fried, Hilda (1993). "Plain Talk" about children with Learning Disabilities. In service presented in Northeast District, Ohio

Inclusive Education

Children, who learn together, learn to live together.

What is Inclusive Education?

(i) Inclusive education means that all students in a school, regardless of their strengths or weaknesses in any area, become part of the school community. They are included in the feeling of belonging among other students, teachers, and support staff.

(ii) Inclusion means young people and adults with disabilities and/or learning difficulties being included in mainstream society.

(iii) Inclusive education means disabled and non-disabled children and young people learning together in ordinary pre-school provision, schools, colleges and universities, with appropriate networks of support.

(iv) Inclusion means enabling pupils to participate in the life and work of mainstream institutions to the best

of their abilities, whatever their needs.

(v) The inclusion concept acknowledges the diversity present among the children in the general classrooms and addresses the fact that every child is a special child.

(vi) Inclusive schools help the development of communities where all people are equally valued and have the same opportunities for participation.

(vi) Inclusion is an on-going process, not a fixed state.

The Need of Inclusive Education…

As special schools were not able to provide education to the vast majority of children with disabilities integrated education emerged in the 20th century. In existing integrated education programmes, the specialist teachers provide most of the essential as well as support services whereas the general classroom teachers provide additional assistance to children with disabilities in the classroom. Experiences have revealed that integration too is not able to improve the coverage, and therefore, the inclusion concept is promoted as the viable alternative to make education of all children with disabilities a reality. In inclusive setting, education of children with disabilities should be treated as an Integral part of general education and therefore, the essential services have to be provided by the general classroom teachers themselves and the support services only are to be provided by the specialist teachers.

The Reasons for Inclusion…

(i) All children have the right to learn together.

(ii) Children should not be devalued or discriminated against by being excluded or sent away because of their disability or learning difficulty.

(iii) Disabled adults, describing themselves as special school survivors, are demanding an end to segregation.

(iv) There are no legitimate reasons to separate children for their education. Children belong together — with advantages and benefits for everyone. They do not need to be protected from each other.

(v) Research shows children do better, academically and socially, in inclusive settings.

(vi) There is no teaching or care in a segregated school which cannot take place in an ordinary school.

(vii) Given commitment and support, inclusive education is a more efficient use of educational resources.

(viii) Segregation teaches children to be fearful, ignorant and breeds prejudice.

(ix) All children need an education that will help them develop relationships and prepare them for life in the mainstream.

(x) Only inclusion has the potential to reduce fear and to build friendship, respect and understanding.

We Must Remember..

(i) that Inclusive education is a human rights issue.

(ii) that the greatest barriers to inclusion are caused by society, not by particular medical impairments.

(iii) to reject the medical model of disability, and respond positively to the social model.

(iv) that the benefits of inclusion are two-way but most of us haven't experienced that yet.

(v) that inclusion in education is one aspect of inclusion in society.

What Does an Inclusive Classroom Look Like...

(A classroom in which children with a diversity of learning needs and abilities share instructional space and all staff members who are responsible for providing support work together to benefit all the students in the class. A variety of services are provided and a variety of student needs are met inside the regular classroom.)

(i) Inclusive classrooms look different all the time because the environment is created by whatever interactions the teacher and students have as a group or as individuals in the group.

(ii) It's a lot of students doing different things with people helping them, students moving from one environment to another. It's also a classroom where everybody is smiling, the students are actively engaged, and the teacher is delighted to be there. It sounds like pandemonium and looks messy.

(iii) Students spend a lot of time in learning centers where they make a lot of choices about what they're working on. It's a classroom where learning often happens in small groups with peer helping and supporting each other's.

(iv) It's a classroom with a lot of time for social interaction that means something to curriculum expectations.

(v) It's a classroom that is student-centered. Students have a high level of responsibility for creating their community. They help structure the rules and are expected to follow them and to meet contracted expectations for curriculum.

(vi) It's a classroom where students know others will be doing different things and the issue of fairness doesn't come into play because that's just the way it is.

(vii) It's a classroom that reaches beyond the classroom and into the community as a resource for learning new skills.

Teaching Strategies...

Dr. Christopher Kliewer, who taught for four years in an inclusive elementary

school, offers the following broad outline for an inclusive classroom:

(i) Inclusive education is nothing more than good teaching for all students.

(ii) Students take responsibility for their education; they help create the structure of the classroom, including helping to establish rules and academic program.

(iii) Teachers have high expectations that all students will meet the rules and academic challenges.

(iv) Families are involved.

(v) Curriculum is focused on humanity, on one another's worth. The students tell their own stories or other's stories and learn about things that matter in their lives.

(vi) Teachers throw out the worksheets and basal reader system; they create curriculum that involves students.

Ideas for behavior strategies :

Kliewer says it's time to re-conceptualize the classroom and not automatically think bad behavior is the student's problem and something that needs to be controlled. Here are some ways to begin:

(i) Classrooms need one main rule - respect one another. After this, if students and teachers create interesting curriculum with material that matters in the students' lives, then students will be interested, involved, and focused on what they've designed.

(ii) Teachers need excellent observational skills to determine what caused a behavior problem.

(iii) Structure the environment so students are actively engaged and motivated. That will be good teaching for all students. This will involve collaboration and networking. It also means the teacher is not always in control, but is one of a team of problem solvers including students, parents, and other teachers.

(iv) Other common strategies for content area instruction and solving behavior problems include peer tutoring, cooperative learning, and reciprocal teaching. These are all instructional techniques that have been around for a long time and provide ways for a class to work together toward a common goal, but don't mean that everyone is doing the same thing.

Problem-Solving Approach for Behavior Strategies

A functional assessment of problem behaviors can help general education teachers deal with behavior assessment and curriculum modifications. This is a proactive, deliberative approach that involves a team consisting of the student, parents, professionals, and teachers who ask questions about the physical environment, social interactions, instructional environment, and non-school factors.

For example, questions concerning the physical environment may include:

(i) Are there too many people in the room?

(ii) What about the physical arrangement of the class?

(iii) What about the lighting of the room?

Instruction environment questions the team could ask:

(i) Is the work too hard? too easy?

(ii) Is the pace too fast? too slow?

(iii) Is the teacher too loud?

Social and non-school factor questions:

(i) Has the student had enough sleep?

(ii) Enough to eat?

(iii) Is the student involved in delinquent behavior?

Based on the assessment answers, the team plans a strategy to modify the environment so the child's problem behavior does not occur. Dr. Susan Etschedit points out that this is just good teaching. "If I change the material I'm using because I realize it's redundant for one student, all the other students who were a little bit bored also benefit and find the work more interesting."

This is one way to look at the variety of supports for adaptations (fig 1):

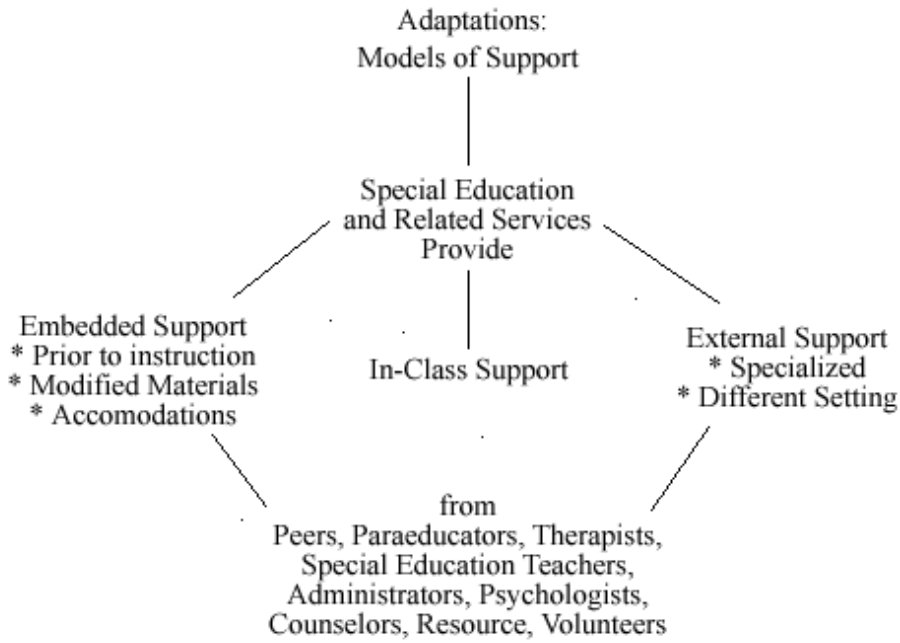

Fig 1 . Variety of supports for adaptations

How to Generate Learning Supports

From a hands-on adaptation booklet, these suggestions for general educators offer ideas for generating learning supports for students to provide enough assistance to hlep the learner but not too much support to promote learned helplessness.

(i) Identify the sub skill that is difficult for the youngster.

(ii) Based on direct observations, speculate why the student is having difficulty.

(iii) Identify competing stimuli or alternative choices that are confusing the youngster and interfering with the correct response.

(iv) Generate viable supports to help the student provide the correct response.

(v) Gradually fade out the supports so the youngster no longer depends on it to guide and direct his/her response.

Starting Points…

Here are a few starting points for working to prepare students, teachers, and administrators to be part of an inclusive school.

1. Address attitudes and values - Have involved persons identify what areas of inclusion they are comfortable with and what they are not comfortable with. Don't put values on these; just identify them.
2. Information - Read books, watch videos, talk to teachers of inclusive classrooms, do simulation activities for an inclusive classroom, visit inclusive schools to get information to build self-confidence and self-esteem for teachers and students to be part of inclusive education.
3. Application – Take the risk with a support system in place to be receptive and willing to accommodate children with greater needs. This takes leadership from principals, teachers, and students and means a whole attitude of acceptance, tolerance, and respect.

Involving Parents…

Welcoming parents into a classroom and school is vital to having them be part of the team for inclusive education. Parents of students with disabilities are often the driving force behind the push for inclusive education.

Parent education is the other key to help parents who may question the academic validity of inclusive education. Some parents may think their children will not make the same academic gains in an inclusive setting as students in a rigorous academic class. Susan Etschedit (UNI) states research shows the opposite is true. "Not only are all students making strong academic gains, but the literature clearly documents social, interpersonal, and personal gains. An inclusive setting not only does not deter act from the usual education program, but it enriches the educational

environment for all children. We have empirical research to validate this information and, more importantly, teacher testimony to tell us how inclusive education works."

On the other hand, parents of students with disabilities are most concerned that their child will be teased or harmed and not be safe. Again, Macfarlane states that in almost every instance after two years of integrated education, this was not a problem or the problem was very small. "The reality is that all kids are teased at school," she notes, "so let's work on teasing and helping children understand it is not acceptable."

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An Approach to Global Developmental Delay in Children

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The pediatrician's clinic is a place where most children younger than 5 years are assessed regularly. Parents expect their pediatricians to give them guidance on developmental issues. Since child development is a dynamic process, periodic screening is necessary. Thus infants and young children can be screened for developmental delays during their routine healthcare visits.

The various streams of development, including gross motor, fine motor, language, cognitive, and social behavior, are interrelated. Detecting developmental delays early is challenging, because children develop in spurts and at times discontinuously. Once a developmental delay comes to the attention of the doctor the main dilemma is in deciding which child needs further evaluation, as developmental delay is a cause for anxiety for parents. This concern may create a tendency to identify only markedly delayed children.

Initial screening is important not only in identifying children with developmental delay but also is the first step in determining whether a child has global delay, a language disorder, or an autistic spectrum disorder. When there is significant delay in two or more of the following areas: gross/fine motor, speech/language, cognition, social/personal, and activities of daily living,[5] the child is said to have Global Developmental Delay (GDD). GDD is a clinical presentation that has a heterogeneous etiologic basis. The term GDD is usually reserved for younger children (ie, typically less than 5 years of age), whereas the term Mental Retardation is usually applicable for older children when IQ testing is more valid and reliable.

Identification of a globally delayed young child in the first years of life needs a careful search for an underlying etiology. Accurate etiologic diagnosis is important (despite the fact that many disorders have no specific treatment), in determining treatment, prognosis, ongoing management of associated conditions, assessment of recurrence risk,and counseling families.

Evaluation of the child with global developmental delay[7]

A detailed history including family history and physical examination is the begining. Check hearing and vision in all children with GDD. Screening for autism or a language disorder should be considered in any child presenting with GDD.

Consider EEG if history suggestive of possible seizures, or an epilepsy

syndrome. History of perinatal asphyxia or physical findings such as microcephaly, focal neurological signs or focal seizures may suggest acquired CNS injury or an underlying cerebral malformation and thus prompt neuro-imaging study (MRI preferable to CT).

In the absence of newborn screening, a screening metabolic evaluation including capillary blood gas, serum lactate and ammonia levels, serum amino acids and urine organic acids, and thyroid function studies (T4 and thyroid stimulating hormone) may be considered. If there is a family history of a close family member (sibling, aunt/uncle, or first cousin) with global developmental delay on a known basis, testing specific for the known disorder may be done. When there is a family history of unexplained developmental delay, cytogenetic testing (which may include testing for subtelomeric rearrangements) may be obtained. Observed dysmorphic features may prompt specific testing for such conditions as Down syndrome (karyotype), Fragile X (*FMR1*), Rett syndrome (*MECP2*), Prader-Willi/ Angelman (FISH), or hypothyroidism. Risk factors for lead exposure mandate screening for lead toxicity.

In the absence of any clinical features that suggest a specific diagnosis it is less likely to be associated with a definable disease and thus a stepwise approach is recommended, as shown in the fig 1.

Indications for Special Investigations

Metabolic studies :

Most children with an inborn error of metabolism have other symptoms (eg, failure to thrive, developmental regression, episodic decompensation) or physical findings (eg, hepato-splenomegaly, coarse facial features) that prompt diagnostic testing. This may be supported by history of consanguinity or family history. Neonatal screening programs for metabolic disorders (involving amino and organic acids and thyroid function) identify infants with conditions that are associated with global developmental delay, very early on in life. However, as in our country there is no universal neonatal screening program, metabolic screening is all the more important in a child with global developmental delay. Routine screening for inborn errors of metabolism in children with global developmental delay has a yield of about 1%[1,2] , but the yield is much higher in the absence of universal neonatal screening programs.

Cytogenetic studies :

Routine cytogenetic testing may be considered in the evaluation of the child with developmental delay even in the absence of dysmorphic features or clinical features suggestive of a specific syndrome. In children with unexplained moderate or severe developmental delay, additional testing using newer molecular techniques (eg, FISH,

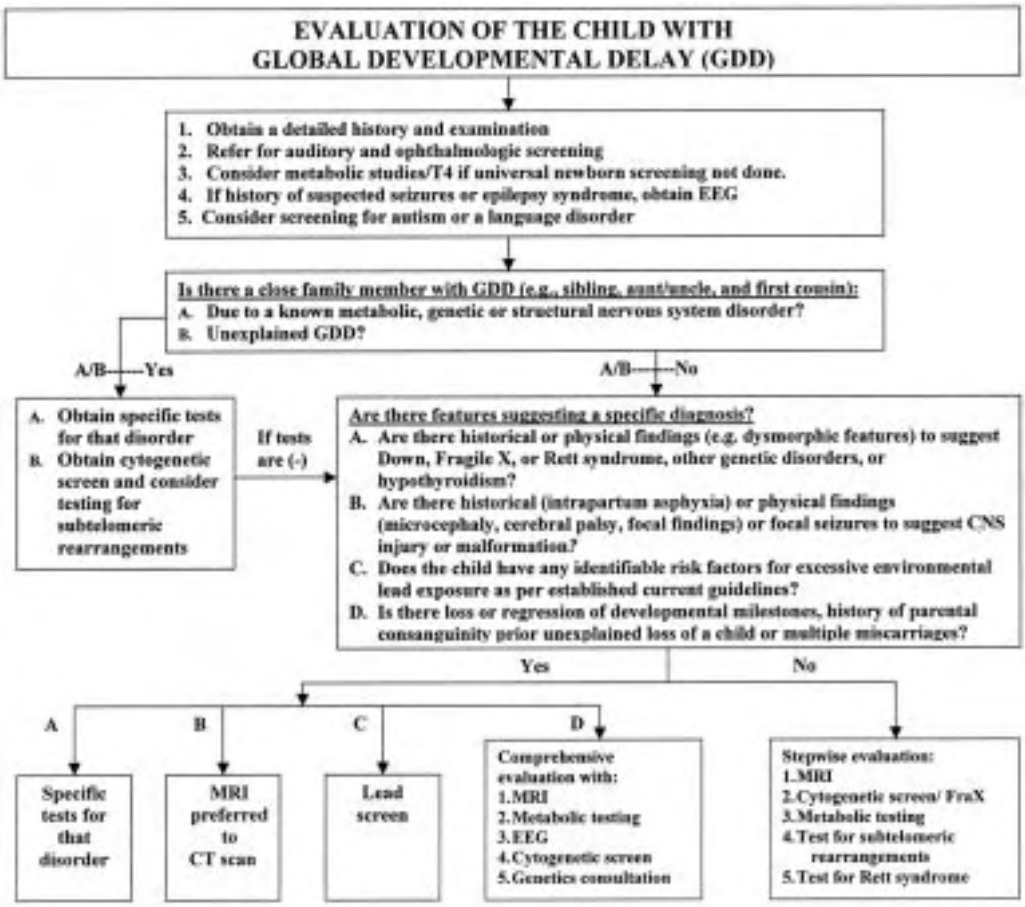

Fig 1. Stepwise approach to global developmental delay

microsatellite markers) to assess for subtelomeric chromosomal rearrangements may be considered.

Fragile X studies :

Fragile X syndrome, due to a mutation of the *FMR1* gene, represents *the most common inherited disorder causing global developmental delay*. Four forms of the CGG trinucleotide repeat have been described: normal (6 to 40 repeats), intermediate (41 to 60 repeats), premutation (61 to 200 repeats), and full mutation (>200 to 230 repeats). In females, premutation or carrier rate is estimated to be between 1 per 246 to 468 individuals in the general population.[8] A simple seven-item checklist of clinical features in the males can help in clinical preselection for molecular diagnosis. These seven items include a family history of mental retardation, facial features including either a long jaw or high forehead, large and/or protuberant ears, hyperextensible joints, soft and velvety palmar skin with redundancy on the dorsum of

the hand, enlargement of the testes, and personality attributes with initial shyness and lack of eye contact followed by friendliness and verbosity. Although screening for fragile X is more commonly done in males because of the higher incidence and greater severity, females are frequently affected and may also be considered for testing. Because siblings of fragile X patients are at greater risk to be symptomatic or asymptomatic carriers, they can also be screened.

Testing for Rett syndrome :

After Downs syndrome, Rett syndrome is believed to be the most common cause of developmental delay in females, [9] and is caused by mutations in the X-linked gene encodingMECP2. Milder variants in females and more severe phenotypes in males have recently been recognized. Patients with classic Rett syndrome appear to develop normally until 6 to 18 months of age, then gradually lose speech and purposeful hand use, and develop abnormal deceleration of head growth that may lead to microcephaly. Seizures, autistic-like behavior, ataxia, intermittent hyperventilation, and stereotypic hand movements occur in most patients. The diagnosis of Rett syndrome should be considered in females with unexplained moderate to severe mental retardation. If clinically indicated, testing for the *MECP2* gene deletion may be obtained.

Molecular screening for subtelomeric chromosomal rearrangements : [10]

Up to 6% of children with moderate to severe developmental delay might have small rearrangements involving the ends of chromosomes (subtelomeric rearrangement).

What is the role of lead screening in children with global developmental delay?

Low-level lead exposure remains possible, and it has been estimated that each 10 µg/dL increase in blood lead level may lower a child's IQ by about 1 to 3 points.[3] Low-level lead poisoning is associated with mild cognitive impairments but not with global developmental delay. Children with developmental delay whose oral behaviors place them at significant risk for lead exposure (pica associated with iron deficiency anaemia) may be screened.

EEG :

Given the higher incidence of epilepsy and behavioral disorders in children with global developmental delay, EEG is often considered at initial evaluation. However the utility of EEG from a diagnostic perspective is doubtful. An EEG can be obtained when a child with global developmental delay has a history or examination features suggesting the presence of epilepsy or a specific epileptic syndrome (eg, Lennox-Gastaut syndrome, myoclonic epilepsy, Rett syndrome), the EEG in these circumstances has confirmatory value.[4]

Role of neuroimaging :

Neuroimaging is recommended as part

of the diagnostic evaluation of the child with global developmental delay. The presence of physical findings (e.g., microcephaly, focal motor findings) increases the chance of making a specific diagnosis. If available, MRI should be obtained in preference to CT scanning.

Vision and hearing disorders in children with global developmental delay :

It is suspected that children with global developmental delay are at greater risk to have vision and/or auditory impairments and evaluation for such impairments is an important component in the initial management of the child with global developmental delay. These impairments interfere with developmental progress or rehabilitation effects. Often these impairments are correctable and their correction may improve developmental outcome. Because speech and language delay is often a feature of global developmental delay and may be the result of a hearing loss, audiologic testing is often undertaken. Children with global developmental delay are at higher risk for hearing loss. Vision assessment can include vision screening and a full ophthalmologic examination (visual acuity, extra-oculo-movements, funduscopic examination). Audiometric assessment can include behavioral audiometry or brainstem auditory evoked response testing when feasible.

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Common Pediatric Sleep Disorders

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Paediatric sleep medicine is a relatively new but none the less important and rapidly emerging expertise. There is increasing awareness that many sleep disorders encountered in adult life originated from childhood. Thus, lies the importance of recognition and adequate management of such problems to optimise the outcome. Proper training of healthcare professionals and the ability to recognise symptoms remains the first step towards achieving proper and timely diagnosis. Behavioural management still remains the cornerstone in managing the paediatric sleep difficulties. However, at times it is necessary to use pharmacological treatments to manage severe sleep disorders. The evidence base for using such medications is poor and most of the current treatments rely on supportive data extrapolated from adult population. Several international working groups and multicentre studies are on going and supportive data is hugely needed to evaluate new technologies and recent pharmacological agents that are emerging in managing this problem. A recent review by Paul Gringras[1] highlights the issues of managing paediatric sleep disorders.

The impact of childhood sleeping difficulties on the child and the family are easy to perceive. The family members are absolutely drained- physically and emotionally and very often need extra help and support themselves before they are able to follow any therapeutic regimen for the child. Children do need a good night's sleep for optimal daytime learning and behaviour. Sleep loss impacts on brain plasticity and thus affects cognitive skills. These cognitive effects are very important in early infancy[2]. The physical health of the child is also affected by lack of sleep. There are important correlations between short sleep and obesity in childhood[3].

Paediatric sleep disorders are often hard to diagnose and thus missed. Children who sleep poorly are often simply not sleepy through the day. Instead they come across as irritable and present as hyperactive kids with poor memory, attention and creative skills. This atypical presentation is further compounded by the fact that teachers and carers still lack awareness about children and their sleeping patterns. A good knowledge of normal sleep ranges and the changes that occur with developmental progress are essential before problems can be identified. A detailed sleep history is essential either from the carer or child. This is not a time consuming procedure if one is aware of all the possible

diagnoses being looked for.

Childhood sleep difficulties fall in four broad categories:

(i) Falling asleep at the right time
(ii) Staying asleep
(iii) Unusual night time behaviour
(iv) Too sleepy during the day

Unable to Fall Asleep at the Right Time

Insomnia is difficult to define in children and adolescents due to developmental issues and differences in presentation. One of the main areas that children fail to meet the diagnostic criteria for "insomnia" per se is that children often do not complain about their sleep or perceive it as problematic. Rather, it is usually the parents or caregivers who bring the issue to the attention of healthcare professionals. In addition, it is often difficult to ascertain the impact of the insomnia on daytime functioning, especially for children and adolescents with special needs. Whether particular sleep behaviours are a problem depends on a complex combination of parental perceptions, expectations, cultural standards and biological norms. Bedtime expectations vary widely within different countries and cultures.

Based on criterion set by International Classification of Sleep Disorders: Diagnostic and Coding Manual(ICSD), paediatric insomnia is defined as repeated difficulty with sleep initiation, duration, consolidation or quality that occurs despite age appropriate time and opportunity for sleep and results in daytime functional impairment for the child and/or family[4].

Sleep Onset Insomnias

The sleep onset association type typically presents as frequent night waking. It is most often seen in infants and toddlers (aged 6 months to 3 years) and is usually the result of inappropriate sleep associations (eg, rocking, nursing, watching TV, sleeping in the parents' bedroom), which are required for the child to fall asleep at bedtime and return to sleep following normal night-time arousals. Typically developing toddlers often wake up at night and most can learn to settle on their own. In a small number of children there may be other medical problems like gastro-oesophageal reflux, milk allergy or any other cause of pain. In older children mood disorders are important causes of both insomnia and poor sleep maintenance.

Sleep onset insomnias are more common in children with learning difficulties, autism and attention deficit hyperactivity disorder. It is difficult to find an exact reason for this. It may be that this group of children has general lack of awareness to environmental cues that help set circadian rhythms, have physiological disturbance of the circadian and homeostatic sleep mechanisms, or an exaggeration of daytime behavioural problems.

Interventions

Behavioural approaches – Often clinicians are faced with the difficulty of convincing parents who are exhausted and feel that they have tried the sleep time hygiene routine and would want a ready fix. However, the evidence shows the immediate and sustained value of behavioural approaches, even in difficult groups of children who may have associated developmental or medical problems[8].

Recently, the American Academy of Sleep Medicine published standards of practice document on behavioural treatments of bedtime problems and night wakings in young children. Across the board, behavioural interventions were found to be efficacious, with 94% of studies finding that treatment is efficacious and improvement was seen in 80% of children[5]. The evidence base strongly suggests that a clinical psychologist is an essential member of a paediatric sleep disorder team. The psychologists are able to support the family through the difficult stages of techniques like standard extinction approaches ("leaving the child to cry it out") and graduated extinction (checking method whereby the parents go in after few minutes of crying and then gradually increases the interval)[1].

Melatonin – The administration of melatonin in sleep disorders has increased dramatically since it was used in helping the sleep of adults with visual impairments. Melatonin in now widely used in managing paediatric sleep disorders, despite low level of supportive evidence and also huge variation in dose range and indications amongst clinicians[6].

In randomised studies of typically developing children with sleep onset insomnia, melatonin significantly improves sleep latency (time to fall asleep) and quality of life, although it has not been shown to make a significant difference to total time asleep[7]. Similar results have emerged from studies of children with ADHD and problems falling asleep. It seems that in these group of children Melatonin acts to advance sleep phase rather than just acting as a soporific. The use of melatonin did not affect daytime behaviour, cognition or quality of life. Results from studies in children with learning difficulties, autism and epilepsy broadly show the same results[8].

The adverse effects of melatonin reported in the various studies are few and in controlled studies occur in equal frequencies in melatonin and placebo arms. However, the controlled studies have been for short duration (average 4 weeks) and there is little data on long term effects.

Antihistamines – The sedative side effects of antihistamines have long been used for childhood insomnia, and may improve sleep and speed up behavioural programmes over short periods[9].

However, tolerance can develop quickly and some children can experience dramatic and paradoxical over-arousal.

Clonidine – Clonidine is an anti-hypertensive agent with sedative side effects. The therapeutic window is narrow; both for adverse effects on sleep architecture and toxicity. Tolerance can develop over time leading to increased doses and increased risk of adverse effects.

Benzodiazepines and non-benzodiazepine hypnotics – The role of benzodiazepines in managing adult insomnia remains controversial and there is no paediatric safety data available regarding the role of benzodiazepines in managing childhood insomnia. Benzodiazepines can shorten sleep latency and decrease awakenings for adolescents, but also change sleep architecture.

Children seem to be particularly sensitive to adverse effects including daytime behavioural disinhibition, ataxia and amnesia[1].

More is known about the pharmacokinetics of zolpidem in children[10] and a recent RCT compared it to placebo for children with insomnia associated with ADHD[11]. Reports from this study describe no superiority of zolpidem to placebo on sleep measures, and a high, 7% dropout rate due to adverse effects of which dizziness, headaches and hallucinations were the most common.

Chloral hydrate and triclofos – Chloral hydrate and triclofos were formerly popular hypnotics for children but have a very long half-life and considerable potential for ''hang-over'' effects in children. Chloral hydrate and triclofos are now mainly used for sedation during diagnostic procedures. Toxicity is also a concern due to a central nervous system depressant action and arrhythmogenic potential.

Herbal preparations – Lavender oil and other herbal options have been used to improve sleep since ancient times. There are very few data regarding the use of herbal preparations in managing insomnia in children.

Delayed Sleep Phase Syndrome

This disorder is most commonly seen in adolescents, although occasionally is also experienced by children. The defining feature of DSPS is a sleep-wake schedule that is significantly and persistently delayed by 2 or more hours beyond the desired bedtime, and conflicts with an individual's activities of daily living (e.g. school, work, scheduled activities)[12].

DSPS is a multi-component disorder, caused by genetic, biological and psychosocial factors[13]. The quality of sleep is not affected and the children do not have problem sleeping at the delayed sleep time.

Treatments – Treatment for DSPS involves first shifting sleep timing and then maintaining a strict and consistent

sleep-wake schedule[14].To shift the sleep-wake schedule, either phase advancement (bedtime is advanced by 15 minutes every few nights) or phase delay/chronotherapy (bedtime and waketime are delayed by 2 to 3 hours each day) can be conducted. The initial treatment phase is generally intense and requires strict adherence to the treatment protocol. Maintenance, however, is also important, as there is a natural tendency to gradually shift over time to a later bedtime and wake time. Successful treatment requires a motivated patient and family, as well as a coordinated approach. Medication and/or bright light therapy can also be considered in conjunction with shifting the sleep-wake cycle. The most common medication considered is melatonin. The dose and timing appear to be important; the melatonin ideally needs to be administered about 4–6 h before the dim light melatonin onset time. Combinations of exogenous melatonin and morning bright light phototherapy are helpful[15]. Evidence suggests chrono-therapy is helpful in restoring normal sleep wake timing, and then a combination of early evening melatonin and morning bright light (light treatment with up to 2000 lux to suppress endogenous melatonin production) necessary to maintain an appropriate circadian rhythm[1].

Unusual Behaviours Occurring During Night

Non-REM sleep disorder :

Confusional arousals, sleepwalking and night terrors are a range of sleep disorders that arise out of incomplete transitions between deep non-REM slow wave sleep and waking. These usually occur in the first third of the night. The child has an expression of fear; usually screams and parents are often unable to console them. This appearance is often very distressing for the parents. Most children will grow out of these benign events and thus explanation and reassurance is usually all that is required. In persistent or severe cases, it is useful to exclude precipitating factors like sleep disordered breathing and periodic limb movement disorder. A strategy of scheduled wakening[16] shortly after the child has fallen asleep seems to help these cases. When the episodes are severe, persistent and interfere with day-to-day functioning (the child is not allowed to go for school trips), it is often helpful to use a short-term low dose benzodiazepine, like clonazepam.

REM sleep disorder :

Nightmares unlike night terrors arise from REM sleep and can be recalled by the child. Nightmares can be precipitated by medications like b blockers. There is no evidence of pharmacological intervention in managing nightmares. REM sleep behaviour disorder is very rare in childhood. Narcolepsy and various neurological conditions, including brain stem tumours, need to be excluded before concluding that the

disorder is of idiopathic origin.

Rhythmic movement disorders :

Head banging, body rocking and moaning while sleeping are common in young children. These disorders occur from wake to sleep phase but can happen through the night. The parents are obviously distressed and concerned but the child usually remembers nothing. Scheduled waking has been used with some success, but reassurance is the most important step.

Problems Staying Asleep

Restless leg syndrome and periodic limb movement disorder :

Restless leg syndrome (RLS) is increasingly being recognised in children. Reviews have suggested associations with ADHD and untreated sleep disordered breathing[17;18]. RLS is described as an unpleasant sensation in the legs that lead to a strong desire to get up and walk around, which sometimes relieves the symptoms. RLS is often accompanied by rhythmic movements of the legs (or less commonly the arms) during the night, known as periodic limb movement disorder (PLMD). Both RLS and PLMD are usually impossible to diagnose on the basis of history alone. Investigations like polysomnography with anterior tibialis surface EMG recordings to monitor leg movements are required for formal diagnosis[1].

RLS and PLMD become clinically important when associated with daytime tiredness or inattention. In most children, specific pharmacological therapy is unnecessary unless the disorder is causing significant functional disturbance, such as insomnia or excessive daytime sleepiness. There has been reported association between iron level in CSF and PMLD. Many children with PLMD and low ferritin levels show a response to oral iron therapy[19]. There is no pediatric data on benefits of using dopamine agonists (ropinarole, pramipexole)[20] and Gabapentin and

Clonazepam[1].

Obstructive sleep apnoea syndrome:

Sleep related breathing disorders are common in childhood, particularly at certain ages and in relation to certain clinical conditions and genetic syndromes[1]. A significant proportion of cases of obstructive sleep apnoea at around 3–5 years of age are due to adenotonsillar hypertrophy. Surgical removal of tonsils and adenoids is the usual treatment. In mild cases intranasal steroid sprays (usually fluticasone) and leukotriene antagonists can provide short term improvement[21;22].

Excessive Sleepiness through the Day

Narcolepsy – Narcolepsy is a rapid eye movement sleep disorder. Accumulating evidence indicates that signs of narcolepsy may start during childhood when daytime sleepiness is the primary presentation. Vivid sounds and images before sleep onset (hypnagogic

hallucinations), abrupt loss of muscle tone (cataplexy) often triggered by laughter or surprise, and later sleep paralysis can occur[1]. Early diagnosis remains difficult with symptoms of daytime sleepiness usually preceding cataplexy. The presentation of cataplexy also can be subtle and mistaken for clumsiness or misdiagnosed as epilepsy leading to inappropriate investigations and treatment[23] .

Recent data suggest that a deficiency in the hypothalamic orexin/hypocretin system underlies the pathogenesis of narcolepsy with cataplexy[24].

Thorough explanation to parents and schools can help with the provision of scheduled naps during the day. There is good evidence in adult populations that both modafinil and methylphenidate can reduce the degree of daytime sleepiness[25]. There are some data for adolescents but none for younger children.

Kleine Levin syndrome – Kleine Levin syndrome is a rare disorder characterised by recurrent episodes of hypersomnia that typically occurs in intervals of weeks or months. Often there is associated hyperactivity, behavioural problems and hyperphagia. There have been episodes of inappropriate sexualised behaviour. Literature review on this subject reveals that prognosis was good with or without treatment. The episodes that usually commence in adolescence seem to self-limit by the age of 20 and 25 years[26].

The review identifies lithium as the commonly used medication. The use of stimulants has also been suggested for sleepiness but overall experience of use is limited.

Summary

Normal sleep is crucial for brain function, behaviour, and normal metabolism. Consistently, sleep loss has been linked to behavioural and attention problems, impaired learning and memory, obesity, and psychiatric disorders. The neurological mechanisms that govern sleep initiation and maintenance are poorly understood. The types of insomnia are age-dependent and can occur as primary disorders, or in the context of another primary sleep disorder such as restless legs syndrome, or secondary to another underlying medical condition. Children with chronic diseases and especially children with neurodevelopmental disorders are at particular risk of insomnia. Pediatric insomnia is common and is a source of potential psycho physiological stress to both children and their caregivers. The causes of insomnia are various. Pediatricians should have a working knowledge of the causes of sleeplessness in order to promptly curtail the chronic effects of sleep loss and effectively screen for underlying, potentially treatable disorders.

There are many gaps in the current knowledge about pediatric sleep

disorders and its management. Thus it also makes paediatric sleep medicine an exciting and rapidly developing expertise, which is essential for the overall well-being and development of children.

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