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Many physicians consider examining the nervous system as one of the most difficult parts of the physical examination. Difficult and poorly cooperative children remain the most challenging group to examine accurately and completely. In this situation, the physician becomes less confident about the neurological findings and clinical evaluation. Several factors are predictive of difficult behavior during the evaluation, including anxiety when meeting unfamiliar people, short time to adjust to the medical situation, previous hospitalization, fear of injections, and parental anxiety. Limited neurological literature addresses the issues relating to the examination of difficult and poorly cooperative children. In this review, some practical tips and techniques are presented that can be used to improve the likelihood of obtaining accurate information about the neurological status of young and difficult children. Certainly, repeated examinations and experience play an important role; however, solid knowledge, strong communication skills, accurate observational skills, and use of proper techniques are crucial for eliciting and interpreting neurological signs in difficult children. Finally, a patient and empathetic physician and supportive guiding parents are needed for a successful neurological assessment.

Keywords: neurologic examination

Neurological disorders are common in Saudi Arabia, accounting for up to 30% of all consultations to pediatrics.[1] Consanguineous marriages are common traditional practice within some sections of the Saudi community and result in the high prevalence of many inherited and genetic neurological disorders.[1-4] Diagnosing these disorders requires accurate assessment, including detailed neurological examination, which is an important step in formulating differential diagnosis and guiding laboratory investigations.[5,6] Furthermore, physicians are usually judged by parents according to their skills in examining their children.[6] Many students, residents, and generalists consider examining the nervous system as one of the most difficult parts of the physical examination. The junior physician is frequently faced with certain problems, including organizing a complete examination in a short period and consistently eliciting neurological signs.[7] However, difficult and poorly cooperative children remain the most challenging group to examine accurately and completely. The physician becomes less confident and the neurological signs questionable if the child was uncooperative. Certainly, repeated examinations and experience play an important role; however, solid knowledge, strong communication skills, accurate observational skills, and use of proper techniques are crucial for eliciting and interpreting neurological signs in difficult children.

Many articles in the literature are available regarding the administration of the nervous system examination; however, a concise and simple outline for approaching the difficult and poorly cooperative child is lacking. In this review, I present some practical tips and skills that can be used to improve the likelihood of obtaining accurate information about the neurological status of young and difficult children. Various procedures and techniques of eliciting physical signs and possible pitfalls in the nervous system examination will also be discussed.

Difficulties With the Neurological Examination

Before discussing the approach to the difficult child, it is important to realize that many physicians find the neurological examination difficult to start with.[7] Some junior physicians may use poor cooperation as an excuse not to proceed further and examine the child completely. In a recent study[8] evaluating the attitudes of medical students

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toward pediatric neurology, although 92% found neurological disorders challenging and interesting, 90% thought that neurological signs are difficult to elicit consistently and that children are uncooperative and difficult to examine. This was also documented in interns and residents but to a lesser extent. Al-Asnag and Jan[9] reported that 22% of pediatric clerks found children uncooperative and difficult to examine. The percentage dropped to 8% ($P = .01$) at the end of the clinical rotation, suggesting that the practical pediatric experience influenced their misconceptions and apprehensions.[9] Studies[10,11] from the United States reveal that physical examinations are neglected areas in clerkship curricula, with lack of adequate supervision of students' examination skills. The difficulties in dealing with neurological patients were also documented in generalists and pediatricians.[12-14] General practitioners working in primary care had less confidence in handling neurological patients compared with patients with other common medical conditions.[13] Up to 54% of pediatricians referred more than 90% of their patients with neurological complaints to neurologists.[14] These pediatricians had statistically significantly lower self-assessment scores in knowledge and skills in performing a neurological examination.[14] Confidence in performing the examination is critical in the interest and popularity of pediatric neurology, particularly given that a general decline in the number of trainees selecting the specialty was recently confirmed.[15]

The Difficult Child

Unfortunately, limited neurological literature addresses the issues relating to the examination of the difficult and poorly cooperative child. However, studies[16-20] exist in the pediatric dental and ophthalmology literature. Many children view physicians as threatening and are hostile in the hospital setting. Parents can contribute to the stress of their children when visiting a physician. Fear and anxiety regarding physicians and needles can be easily projected onto the child. Saudi culture may have an additional negative influence because the physician's visit is frequently used as a punishment threat and is correlated with pain and needles. Several factors were found to be predictive of difficult behavior during evaluations, including problems regarding visiting a previous physician, anxiety when meeting unfamiliar people, not enough time to adjust to the medical situation, fear of injections, and parental fear of physicians.[16] In another study,[17] negative behaviors were associated with younger age in children, learning or behavioral problems, and history of hospitalization. Children's temperaments and conditioning factors play important roles in the development of their fear regarding physicians.[18] The developmental stage is also important because children between 2 and 5 years of age are more likely to be uncooperative and difficult to examine. Anxiety related to strangers usually develops after 6 months of age and becomes stronger with advancing age.[21] Therefore, the very young infant and older child are easier to examine. The young uncooperative child may not necessarily be afraid but rather hungry, in pain, or needing a diaper change. Understanding these factors and having patience are important to conduct a detailed and accurate examination. Additional contributing factors to resistance and defiance include the underlying neurological condition that may result in irritability, confusion, or behavioral disorder.[22] Children with developmental or cognitive deficits are at higher risk of being poorly cooperative.[23] A patient and empathetic physician and a supportive guiding parent are needed to prevent excessive fear.

Tips During History Taking

Proper interaction and good communication with the parents are critical because parental behavior has often been cited as a crucial factor in children's ability to cope in stressful situations.[24] The physician should use the time during history taking to inspect the child for any clues of neurological impairment (Table 1). Many organs and functions can be assessed reasonably well by inspection, observation, and behavioral responses. The child should be kept next to the parent during the interview, and approaching him or her in the beginning of the evaluation should be avoided. It would be advisable to be dressed in a normal manner and to avoid wearing the white laboratory coat. It is also useful to present a toy or a lollipop in the beginning of the visit after getting the parents' permission. However, small objects should not be offered to a child younger than 5 years because of the risk of choking or aspiration. Preparatory play with parental involvement before and at the beginning of the examination may improve their coping and ease the child's stress.[24] The physician should try his or her best to smile, behave in a friendly manner, maintain intermittent eye contact with the child to decrease anxiety and to improve cooperation. The child should then realize that the physician does not represent a direct threat.

Tips During the Examination

Evidence suggests that patient anxiety and poor cooperation are sociopsychological in origin.[25] Ongoing communication and adequate information to the parents and the child during the examination procedures can reduce anxiety, uncooperative behavior, examination time, and misunderstanding that cause a poor professional image.[25] Detailed and long examinations may be difficult to perform in an uncooperative child. Only a focused examination may be possible, concentrating on the most relevant aspects (eg, motor system in a child with cerebral palsy). Clues from the history should guide the focused examination. Many neurological signs can be identified by careful observation. For example, the child may not cooperate

Table 1. Summary of Tips for Examining Poorly Cooperative Children

During history taking	Keep the child next to the parent. Observe the child carefully. Smile, be friendly, and maintain eye contact. Avoid wearing the white laboratory coat. Start interacting with the child.
Beginning of interaction	Present a toy or a lollipop. Keep hands off; use observation. Keep the younger child in the mother's lap. Let the parents do the undressing. Try not to show all your tools.
During examination	Start with the most relevant system. Be focused. Use your observational skills, starting with gait. Demonstrate some testing on the parents. Leave threatening or painful tests to the end.
During procedures	Invite parents to attend. Prepare child and parent for their roles. Use the treatment room, with adequate pain control. Position the child in a comfortable manner. Maintain a calm and positive atmosphere.

Table 2. Organized Approach to the Nervous System Examination

Vital signs	Temperature, pulse, respiratory rate, supine and standing blood pressures
Anthropometric measurements	Weight, height, and head circumference, all plotted on percentile charts
General examination	Meningeal signs, examination for dysmorphic features, examinations of the skin, skull, and spine
Core neurological examination	Mental status examination, cranial nerves, motor system, cerebellar examination (including gait), sensory system

for a detailed cranial nerve examination; however, squint, drooling, or facial asymmetry may be evident, particularly in a crying child. Inspection of the tongue and palatal movements is easily performed in a screaming child. Combativeness may be a good sign of normal power, and escaping to or climbing on the mother indicates coordination and motor abilities. I frequently ask the parents to take the child for a walk in the clinic or the corridor for gait and power assessment. In a less difficult child, certain tips are helpful in improving cooperation (Table 1). The physician should try not to show all the tools, which may be viewed as a threat by a scared child. Tools such as the reflex hammer can be presented to the child as an object of play, particularly if an attractive toy is attached to it to make it less threatening. The physician may also use the parents as an example to demonstrate that tendon reflexes will not hurt. Asking the parent to perform certain tasks such as undressing or removing the child's shoes is helpful. Interacting and playing with the child as he or she is being examined improves cooperation. Uncomfortable and threatening components of the examination such as gag reflex, fundoscopy, and planter's response should be saved for last. For infants and toddlers, the most threatening part of the examination is measuring the head circumference. Therefore, measuring the head circumference should be performed at the very end.

Organization of Core Examination

An organized approach, as summarized in Table 2, may not be possible in an uncooperative child. Performing a focused examination is better than a skipped incomplete examination in a poorly cooperative child. Systems related to the main complaint should be examined initially (eg, the motor system in cerebral palsy) before assessing less relevant aspects of the examination. An experienced clinician knows what to look for at the beginning of the examination and is usually confident about what to expect to find. Mental status can be assessed based on the history and the level of alertness and interaction. Behavioral abnormalities such as inattention or hyperactivity should be observed. Most cranial nerves can be examined by observation alone (eg, eye movements, fixation, and facial, tongue and palatal movements). The motor system can be examined by careful examination of the gait. Power can be assessed by giving a toy and then trying to take it back to check for resistance. A small toy can also be used to assess coordination and cerebellar functions. Sensory examination should be left to the end. This examination is difficult even in the cooperative child. Pain testing should be left to the very end, and repeated examinations are always necessary for consistency.

A complete examination of the difficult and poorly cooperative child will take more time. Students and less experienced physicians usually spend a greater proportion of time examining their patients than senior physicians and consultants.[26] This may not be practical in busy practice or during clinical examinations in which time is limited. The performance by medical students and their time management will improve if the neurological examination is observed by a trained neurologist, who is then able to provide immediate feedback.[26] Junior physicians will handle poorly cooperative children better with more experience. It is helpful if the student takes a colleague with him or her to observe each other's skills, look for consistency in eliciting signs, and guide and correct each other. In poorly cooperative children, the physician should avoid spending too much time after examining the most relevant aspects. A higher incidence of correct diagnosis and more effective management do not necessarily follow if the physician is allowed more time. Physicians have been shown to generate the correct hypothesis early, usually within the first 5 minutes of the clinical interview.[27] Many children could have had the correct diagnosis made only on the basis of their history. Furthermore, the length of time spent with the patient was not as critical as effective communication in a walk-in pediatric clinic.[27] Many children with common neurological

disorders such as migraine and epilepsy may have normal results on physical examination.[28,29] However, more time has to be spent in difficult and complicated disorders to make a comprehensive assessment.

Cooperation During Procedures

Medical procedures can be unpleasant experiences for children and their parents.[30] Many difficult and uncooperative children became so after an invasive procedure that involves pain or needles. In special situations in which children need repeated examinations or procedures, coping skills training could reduce their anxiety.[31] A clinical psychologist trained in behavioral psychology, communication, motivation, and control techniques would help in the inpatient or outpatient setting.[32] Several strategies can be used to help increase the comfort of infants, children, parents, and medical staff during invasive procedures as summarized in Table 1. These include (1) preparing the child and parents for the procedure and for their role during the procedure, (2) inviting the parent or caregiver to be present, (3) using the treatment room for stressful procedures, (4) positioning the child in a comfortable manner, and (5) maintaining a calm and positive atmosphere.[32,33] Careful attention is needed for pain control to make the experience less traumatic and to prevent future negative behaviors. Most difficulties arise when the parents and child do not know what to expect or do during such procedures. This remains a problem, particularly in our region. A recent Saudi study[34] revealed that adequate explanations for ordered investigations and treatments were received by only 78% and 69% of parents, respectively. The authors concluded that physicians need to pay more attention to providing explanations and guidance for ordered investigations and treatments.

Summary

Although most physicians find neurological disorders challenging and interesting, many also have difficulties eliciting neurological signs, particularly in uncooperative and difficult children. Most children view physicians as threatening and are hostile in the hospital setting. Proper interaction and good communication with the parents are needed for a successful evaluation. The physician should use the time during history taking to inspect the child for any clues of neurological impairment. Many organs and functions can be assessed reasonably well by inspection, observation, and behavioral responses. The physician should smile, behave in a friendly manner, and maintain intermittent eye contact with the child to decrease anxiety and to improve cooperation. Detailed and long examinations may be difficult to perform in an uncooperative child. Clues from the history should guide the physician to perform a focused examination. When faced with a poorly cooperative child, a patient and empathetic physician and supportive guiding parents are needed for a successful neurological assessment.

References

1. Jan MMS. Perception of pediatric neurology among non-neurologists. *J Child Neurol*. 2004;19(1):1-5.
2. Jan MMS. Pediatric neuro-developmental and behavioral disorders: practitioner's perspectives. *Neuroscience*. 2005;10(2):149-154.
3. Tadmouri GO, Tadmouri NB. Genetic disorders in Arabs as for OMIM. *Neuroscience*. 1999;4(1):1-3.
4. El-Hazmi MAF, Warsy AS. Genetic disorders among Arab populations. *Saudi Med J*. 1996;17(1):108-123.
5. Fuller G. Neurological examination. In: Fuller G, ed. *Neurological Examination Made Easy*. New York, NY: Churchill Livingstone; 1993:1-210.
6. Menahem S. Interviewing and examination skills in pediatric medicine: videotape analysis of student and consultant performance. *J R Soc Med*. 1987;80:138-142.
7. Jan MM, Al-Buhairi AR, Baeesa SS. Concise outline of the nervous system examination for the generalist. *Neuroscience*. 2001;6(1):16-22.
8. Jan MMS, Fida NM. Attitudes of medical students toward pediatric neurology. *Pediatr Neurol*. 2002;27(2):106-110.
9. Al-Asnag MA, Jan MMS. Influence of the clinical rotation on intern attitudes toward pediatrics. *Clin Pediatr*. 2002;41(7):509-514.
10. Stillman PL, Fulginiti VA, Rousseau E, Sabers DL. Results of a survey of pediatric clerkship programs in American medical schools. *Am J Dis Child*. 1981;135(4):348-351.
11. Seegal D, Werthein AR. On the failure to supervise student's performance of complete physical examinations. *JAMA*. 1962;180:476-477.
12. Jan MM, Wazzan OM, Baeesa SS. Impressions and experiences of non-neurologists in neurology. *Neuroscience*. 2005;10(4):272-276.
13. Casabella Abril B, Perez Sanchez J. The attitudes and behavior of the general primary care physician towards the neurological patient. *Aten Primaria*. 1995;15(6):385-386.
14. Maria BL, English W. Do pediatricians independently manage common neurologic problems? *J Child Neurol*. 1993;8(1):73-77.
15. Jan MMS. Pediatric neurologists in Saudi Arabia: an audit of current practice. *J Pediatr Neurol*. 2005;3(3):131-136.
16. Holst A, Schroder U, Ek L, Hallonsten AL, Crossner CG. Prediction of behavior management problems in children. *Scand J Dent Res*. 1988;96(5):457-465.
17. Colares V, Richman L. Factors associated with uncooperative behavior by Brazilian preschool children in the dental office. *ASDC J Dent Child*. 2002;69(1):87-91.
18. Ten Berg M, Veerkamp JS, Hoogstraten J, Prins PJ. Parental beliefs on the origins of child dental fear in the Netherlands. *ASDC J Dent Child*. 2001;68(1):51-54.
19. Salati R, Schiavulli O, Giammari G, Borgatti R. Checklist for the evaluation of low vision in uncooperative patients. *J Pediatr Ophthalmol Strabismus*. 2001;38(2):90-94.

20. Hussein MA, Coats DK, Paysse EA. Use of the RetCam 120 for fundus evaluation in uncooperative children. *Am J Ophthalmol*. 2004;137(2):354-355.
21. Jan MMS, Khalifa MA. Nervous system and development. In: Alhowasi MN, ed. *Manual of Clinical Pediatrics (for Medical Students & Postgraduate Doctors)*. 3rd ed. Riyadh, Saudi Arabia: Medical Book House; 2004:130-176.
22. Raina P, O'Donnell M, Rosenbaum P, et al. The health and well-being of caregivers of children with cerebral palsy. *Pediatrics*. 2004;115(6):626-636.
23. Jan MM. Cerebral palsy: comprehensive review and update. *Ann Saudi Med*. 2006;26(2):123-132.
24. Gutstein SE, Tarnow JD. Parental facilitation of children's preparatory play behavior in a stressful situation. *J Abnorm Child Psychol*. 1983;11(2):181-191.
25. Carroll QB. Improving patient cooperation. *Radiol Technol*. 1979;51(1):68-71.
26. Stillman PL, May JR, Meyer DM, Rutala PJ, Veach TL, Montgomery AB. A collaborative effort to study methods of teaching physical examination skills. *J Med Educ*. 1981;56(4):301-306.
27. Korsch BM, Ethel K, Gozzi PH, Francis V. Gaps in doctor/patient communication, 1: doctor/patient interaction and patient satisfaction. *Pediatrics*. 1967;42:855-871.
28. Al-Khathlan NA, Jan MMS. Clinical profile of admitted children with febrile seizures. *Neuroscience*. 2005;10(1):30-33.
29. Jan MM. Clinical review of pediatric epilepsy. *Neuroscience*. 2005;10(4):255-264.
30. Jan MM, Schwartz M, Benstead TJ. EMG related anxiety and pain: a prospective study. *Can J Neurol Sci*. 1999;26(4):294-297.
31. Del Gaudio DJ, Nevid JS. Training dentally anxious children to cope. *ASDC J Dent Child*. 1991;58(1):31-37.
32. Ollendick TH, King NJ. Empirically supported treatments for children with phobic and anxiety disorders: current status. *J Clin Child Psychol*. 1998;27(2):156-167.
33. Stephens BK, Barkey ME, Hall HR. Techniques to comfort children during stressful procedures. *Adv Mind Body Med*. 1999;15(1):49-60.
34. Jan MM, Al-Asnag MA, Al-Khathlan NA. In-hospital pediatric experience: parent's perspectives. *Curr Pediatr Res*. 2002;6(1):27-31.