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Maternal Supplementation and Vitamin K in Breast Milk

ABSTRACT & COMMENTARY

Synopsis: *The low levels of vitamin K that are found in breast milk of mothers of premature infants can be substantially increased by maternal oral supplementation.*

Source: Bolisetty S, et al. Vitamin K in preterm breast milk with maternal supplementation. *Acta Paediatr* 1998;87:960-962.

Exclusively breastfed infants have low vitamin k levels in their plasma at 6-12 weeks of age despite receiving vitamin K prophylaxis at birth. This is due to the much lower concentration of vitamin K in breast milk. It has been estimated that the daily intake of vitamin K by exclusively breastfed babies is less than 0.2 mcg, whereas the vitamin K intake of infants fed with cow's milk proprietary formulas was 50 mcg/day. Bolisetty and investigators from the Royal Hospital for Women in Sydney, Australia, studied the effect of oral vitamin K supplementation of lactating mothers on the vitamin K levels in their breast milk. Six healthy, lactating mothers who had given birth to preterm infants were given 2.5 mg of oral phylloquinone (vitamin K_1) daily. Phylloquinone was measured in the breast milk daily for 14 days. Phylloquinone levels in the breast milk increased from a baseline of 3 ± 2.3 ng/mL to 22.6 ± 16.3 ng/mL after the first dose and then gradually increased to a plateau of 64.2 ± 31.4 ng/mL after the sixth dose. Bolisetty et al conclude that it is possible to increase the vitamin K content of breast milk to levels comparable to that in infant formulas by daily oral supplementation to lactating women.

COMMENT BY RICHARD A. EHRENKRANZ, MD, FAAP

The fourth edition of *Guidelines for Perinatal Care* continues to recommend that "every neonate should receive a single parenteral 0.5-1.0-mg dose of natural vitamin K_1 oxide (phytonadione) within 1 hour of birth" to prevent early and late vitamin K-dependent hemorrhagic disease of the newborn (HDN).[1] Infants who have not received this prophylactic dose of vitamin K shortly after birth and who are breastfeeding exclusively are at risk of developing vitamin K-depen-

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dent HDN at 4-6 weeks of age due to the low vitamin K content of breast milk. Although the controversy about the potential risk of childhood cancer following IM vitamin K[2] has been discounted,[3] interest in oral vitamin K prophylaxis and in increasing the vitamin K content of human milk has grown during the past several years. Two recent papers[4,5] have demonstrated that a prophylactic dose of a mixed-micellar solution of vitamin K_1 containing natural solubilizers with glycocholic acid and lecithin increases serum vitamin K_1 levels in normal, breastfed infants. However, multiple doses with this formulation would still be necessary to prevent late HDN. Additionally, it is not currently available in the United States.

In their report, Bolisetty et al have confirmed a previous study[6] that the vitamin K_1 content of human milk can be increased with maternal oral vitamin K_1 supplements. They showed that after two daily doses of 2.5 mg, the human milk vitamin K_1 content exceeded the U.S. Recommended Daily Allowance of 26 ng/dL and that the human milk vitamin K_1 content plateaued at about 65 ng/mL after six supplemental doses.

Since there is little milk production during the first 24-48 hours after delivery, maternal vitamin K_1 supplementation will not protect against early HDN in the newborn. However, the need for repeated IM vitamin K prophylaxis could presumably be replaced someday by oral vitamin K_1 prophylaxis to the newborn to protect against early HDN and maternal vitamin K_1 supplementation to protect exclusively breastfed infants against late HDN in infants who have not received neonatal IM prophylaxis. Until such an oral vitamin K_1 preparation is available in the United States, intramuscular vitamin K_1 prophylaxis remains the treatment of choice. ❖

References

1. American Academy of Pediatrics and the American College of Obstetricians and Gynecology. *Guidelines for Perinatal Care*, 4th ed. 1997:157.
2. Golding J, et al. Childhood cancer, intramuscular vitamin K, and pethidine given during labor. *BMJ* 1992; 305:341-346.
3. Greer FR. Vitamin K deficiency and hemorrhage in infancy. *Clin Perinatal* 1995;22:759-777.
4. Schubiger G, et al. Plasma vitamin K_1 concentration in and PIVKA-II after oral administration of mixed-micellar or cremophor El-solubilized preparations of vitamin K_1 to normal breast-fed newborns. *J Pediatr Gastroenterol Nutr* 1997;24:280-284.
5. Greer FR, et al. A new mixed micellar preparation for oral vitamin K prophylaxis: Randomized controlled comparison with intramuscular formulation in the breast fed infants. *Arch Dis Child* 1998;79:300-305.
6. Greer FR, et al. Improving the vitamin K status of breast-feeding infants with maternal vitamin K supplements. *Pediatrics* 1997;99:88-92.

True statements about vitamin K in the newborn period include all of the following except:

a. Maternal supplementation with vitamin K prevents early hemorrhagic disease of the newborn.
b. Neonates who are exclusively breast fed have low serum vitamin K levels at 6 weeks of age.
c. Maternal supplementation with vitamin K should prevent late hemorrhagic disease of the newborn.
d. An effective oral vitamin K preparation is not currently available in the United States.

Cultures for Cellulitis

ABSTRACT & COMMENTARY

Synopsis: *The method of obtaining a sample for culture from a focus of soft tissue infection was studied. Direct negative pressure aspiration resulted in significantly higher total protein recovery compared to the injection/aspiration method of first injecting 0.2 mL of sterile phosphate-buffered saline into the site followed by immediate aspiration. The direct aspiration method,*

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without the injection of saline, yields higher amounts of aspirate material for culture.

Source: Traylor KK, Todd JK. Needle aspirate culture method in soft tissue infections: Injection of saline vs. direct aspiration. *Pediatr Infect Dis J* 1998;17:840-841.

A bovine animal model of soft tissue infection was used to study aspiration through a skin nick with a 20-gauge needle attached to a syringe. Each of 12 pairs consisting of one sample taken by direct negative pressure aspiration and one sample by aspiration following injection of 0.2 mL of sterile phosphate-buffered saline was studied for total protein recovered. The difference was significantly higher (P = 0.019) for the direct aspiration method.

COMMENT BY HAL B. JENSON, MD, FAAP

The best technique to culture cellulitis and soft tissue infections has been controversial. This study showed that direct aspiration, compared to injection/aspiration followed by aspiration, yields a greater amount of total tissue protein for culture. This is supported by a review of 13 published reports of the direct or injection methods that found a significantly higher recovery of bacteria with direct aspiration (75 of 160, 47%) than with the injection/aspiration method (77 of 403, 19%) (P < 0.001). This may be because the core material cut during needle aspiration is not subsequently ejected. One study has shown a higher rate of positive bacterial culture results with aspiration from the point of maximal inflammation than with aspiration from the leading edge,[1] although two subsequent studies have found both sites to be equivalent.[2,3]

Cultures of cellulitis are not always necessary. It is difficult for me to justify cultures of cellulitis on the face where even minimal scarring is undesirable, especially in patients prone to keloid formation. Even cases of periorbital cellulitis associated with minor trauma (e.g., insect bites, scratches) are almost always caused by *Staphylococcus* and/or *Streptococcus* rather than *Haemophilus influenzae* type b. This would be even more likely since the implementation of conjugate *H. influenzae* type b vaccines. Bringing a needle close to the eye in an uncooperative or anxious child for culture of periorbital cellulitis causes even more anxiety in me.

Another issue for children with cellulitis is the value of blood cultures. In immunocompetent children with uncomplicated cellulitis, blood cultures are almost always negative. In a cohort of 243 children with cellulitis, blood cultures were negative except in three children with varicella (who each grew group A-hemolytic streptococci) and two children with septic arthritis (one with *Streptococcus pneumonia* and one with *Staphylococcus aureus*).[4] It is unnecessary to obtain a blood culture in an immunocompetent child with uncomplicated cellulitis (acute onset of cellulitis associated with a break in the skin). (Please realize that this is hard for an infectious disease specialist to say, where the dictum is usually to culture early and often.) The appearance of cellulitis without a break in the skin as a portal of entry should suggest the possibility of extension of underlying infection (e.g., osteomyelitis or septic arthritis) and the need for further evaluation before beginning empiric treatment.

Cultures of tissues and blood from immunocompetent patients with uncomplicated cellulitis without unusual exposure to soil or fresh- or saltwater are generally unnecessary prior to the initiation of empiric antibiotic therapy for staphylococcal and streptococcal bacteria. When a culture of soft tissue or cellulitis is desired, this study supports the use of simple direct aspiration for optimal recovery of material for bacterial culture. Cultures of tissues and blood of patients with cellulitis are indicated for immunocompromised persons, those with development or progression of inflammation while on antibiotics, or with unusual exposures such as soil, fresh- or saltwater, or animal feces or products. ❖

References

1. Howe PM, et al. Etiologic diagnosis of cellulitis: Comparison of aspirates obtained from the leading edge and the point of maximal inflammation. *Pediatr Infect Dis J* 1987;6:685-686.
2. Newell PM, Norden CW. Value of needle aspiration in bacteriologic diagnosis of cellulitis in adults. *J Clin Microbiol* 1988;26:401-404.
3. Epperly TD. The value of needle aspiration in the management of cellulitis. *J Fam Pract* 1986;23:337-340.
4. Sadow KB, Chamberlain JM. Blood cultures in the evaluation of children with cellulitis. *Pediatrics* 1998;101(3):e4. URL: http://www.pediatrics.org/cgi/content/full/101/3/e4.

Soft tissue cultures in cases of presumed bacterial cellulitis:

a. should be considered in immunocompromised patients.
b. if indicated should use local aspiration after injection of sterile saline.
c. are positive in more than 50% of cases, regardless of the method used.
d. should be accompanied by blood cultures in most instances.

How Often Should We be Screening Adolescents for Chlamydia and STDs?

ABSTRACT & COMMENTARY

Synopsis: *It has been recommended that it is necessary to screen sexually active adolescent females as often as every six months because of a high rate of infection and reinfection with chlamydia in such young populations. Such a broad recommendation may not be generalizable to all sexually active adolescent females because many live in low-prevalence chlamydial areas or have few or no risk factors for acquisition of STDs.*

Source: Burstein GR, et al. Incidence of *Chlamydia trachomatis* infections among inner-city adolescent females. *JAMA* 1998;280:521-526.

A prospective longitudinal study to describe the prevalence and incidence of chlamydial infection among adolescent females was undertaken by Burstein and associates at Johns Hopkins in order to define the appropriate interval for chlamydial screening and to define risk factors for chlamydial acquisition in order to develop screening criteria. Consecutive sexually active, largely poor African American (98%), adolescent females aged 12-19 years attending STD, family planning, and school-based clinics in the Baltimore city area were entered into the study. Over a 33-month period, there were 3202 adolescent females who made 5360 visits more than 30 days apart, with the mean number of visits per patient being two (Burstein et al used 30 days to define the period for an "incident infection"). Chlamydia was identified on either endocervical specimens if a pelvic exam was warranted or by first void urine using PCR. During the study period, 29% had at least one positive chlamydial test, with the mean time to first positive chlamydia being 7.2 months and to reinfection (after having a positive test and being appropriately treated) being only 6.3 months. Burstein et al were unable to identify those individuals with most of the infections using the usual STD risk factors, including reason for visit, clinic type, history of STDs, multiple or new partners, or poor compliance with condom use.

COMMENT BY MARY ANN SHAFER, MD, FAAP

Sexually active adolescent females have a high rate of chlamydial infection. However, the rate for all populations, including adolescents, has been decreasing over the past few years. There remain some areas in the country, such as Baltimore, where the prevalence remains extraordinarily high. With the advent of amplified nucleic acid techniques (PCR, LCR) that can yield highly sensitive and specific test profiles when applied to noninvasive urine specimens, we now have a much greater chance to accurately define the true problem of chlamydial infection since we are no longer dependent upon pelvic exams for females or urethral swabs in males to obtain specimens. Urine tests will also make it easier to screen all sexually active youth as often as deemed appropriate in a number of clinical and nonclinical settings to treat infections successfully with appropriate antibiotics and finally to afford us the chance of eliminating chlamydia as a risk to young women.

Although this study did show that among poor youth in Baltimore, chlamydial screening should be broad-based and as frequent as every six months, Burstein et al fail to discuss the risk of infection and possible implications for the youth in the rest of the country, where the prevalence rate for chlamydia is between 5-10% and dropping. While I agree with more frequent screening among adolescents in high-risk prevalence areas, I disagree that Burstein et al have convinced us that this recommendation should also apply to all adolescents. It could be argued that the same study needs to be done in a lower prevalence population in order to have evidence to support or refute the current recommendation by most professional health organizations that all sexually active adolescents be screened for chlamydia and gonorrhea and have a Pap smear annually. The main take-home message for the practicing clinician is that we now can easily and accurately screen for chlamydia using a noninvasive screening test applied to urine. ❖

Screening of adolescent girls for chlamydial infections:

a. can only be done by culture.
b. reveals an increasing incidence of infection in many parts of the country.
c. should always be done annually or more frequently in sexually active adolescent girls from low-risk areas.
d. requires invasive diagnostic procedures.

Prolonged QT Interval and SIDS

ABSTRACT & COMMENTARY

Synopsis: *Neonatal EKGs were performed in a prospective study in more than 34,000 newborns. Twenty-four of these infants died of presumed sudden infant death syndrome (SIDS). Ten of these 24 infants had prolonged QTc intervals (QT intervals corrected for heart rate). Schwartz and associates suggest that a prolonged QTc is associated with an increased incidence of SIDS.*

Source: Schwartz PJ, et al. Prolongation of the QT interval and the sudden infant death syndrome. *N Engl J Med* 1998;338(24):1709-1714.

Schwartz and associates report findings from an extremely ambitious prospective study that

spanned 19 years. They recorded a standard EKG in 34,442 3- to 4-day-old infants and then performed telephone follow-up at one year to determine the incidence of death due to SIDS or other causes. Incidentally, the diagnosis of SIDS was based on an adequate negative postmortem examination. Follow-up data were obtained on an amazing 96% of enrolled infants, and distributions for various conduction intervals were calculated.

The QT interval can be corrected for heart rate (QTc) by dividing the measured QT interval by the square root of the preceding R-R interval (Bazett's formula). In this study population, the mean QTc interval for all newborns was 400 ± 20 msec and did not differ between the genders. The 97.5th percentile was 440 msec, and infants with a QTc longer than this were considered to have a prolonged QTc.

In the first year of life, there were 34 deaths (24 from presumed SIDS and 10 from other causes). Twelve of the 24 infants who died from SIDS had a QTc greater than 440 msec, while all 10 who died from other causes had a QTc less than 440 msec. In fact, Schwartz et al report that a multiple logistic regression and analysis revealed that only a prolonged QTc was a significant predictor of SIDS, with an absolute risk of 1.53% and an odds ratio of 41.3 with a confidence interval of 95%.

COMMENT BY ALAN FRIEDMAN, MD, FAAP

Prolongation of the QT interval favors the occurrence of lethal arrhythmias and is associated with an increased risk of sudden death in several clinical, inherited conditions such as the Romano-Ward Syndrome, the Jervell, Lange-Nielsen Syndrome, and even in apparently normal, healthy persons. The typical arrhythmia associated with a prolonged QT interval is a ventricular tachycardia, often referred to as "torsade de pointes," because the wide ventricular complexes in this arrhythmia resemble the shape of a ribbon that has been twisted on its long axis.

This study presents evidence of an association between SIDs and a long QTc interval, although the nature of the association remains unclear. In addition, several important, but difficult to answer, clinical questions are raised. For instance, is there a potential value in performing a routine EKG in all newborns at 3-4 days? If so, who will read them—pediatricians? pediatric cardiologists? Who will pay for them? While the cost of a single EKG is low compared to many other medical tests, the financial burden for screening every newborn would be substantial.

Before these questions are answered, however, one must pose a more important question: is the EKG a good screening test for identifying infants at risk for SIDS? I believe the data presented suggest that it is not. One must remember that by definition, 2.5% of the enrolled infants had a QTc greater than 440 msec, which equates to 861 infants. Twelve of them died of SIDS, yielding a positive predictive value of 1.4%, a poor yield for any screening test. We must also consider the serious social and emotional effect upon the 98% of families who will be identified as "false-positives" based upon their newborn's EKG.

When one examines the data presented in the report, only four SIDS infants had QTc intervals greater than 460 msec (3 SD), and only two infants had QTc intervals greater than 500 msec, an interval that all would agree is truly prolonged. Perhaps, then, the area of focus should be narrowed to the profoundly prolonged QTc. It would be interesting to know how many infants enrolled, alive and dead, had QTc intervals greater than 500 msec, as these children are likely to have a long QT syndrome (LQTS), rather than a prolonged QT interval. The clinical ramifications of the former are clear, while those of the latter are not. It would also be interesting to have these infants undergo genetic testing to determine if they carry any of the identified abnormalities of cellular channels associated with LQTS. In addition, family history of arrhythmia, sudden death, and EKG findings of parents and siblings would be useful to further the diagnosis.

With regard to the implication that prolonged QTc is a major cause of SIDS, one must remember that numerous infants with so-called "near-miss SIDS" have been observed in hospitalized infants on monitors without a single report of "torsade de pointes" or other significant ectopy. Furthermore, Schwartz et al present no evidence to document that the study infants with prolonged QTC and SIDS had any ventricular ectopy, arrhythmia, or tachycardia.

In summary, this interesting study has raised questions about SIDS, a perplexing and devastating problem. It appears as if there may be an association, direct or indirect, between a prolonged QTc interval and SIDS in some infants who died from presumed SIDS. However, we do not yet know that arrhythmia was the mechanism for SIDS in these infants. Before we change our management practice, it is imperative that we better define the nature of a prolonged QTc interval in infancy, its association (if any) to LQTS, and its possible importance in SIDS. Physicians must resist the temptation to advocate for widespread EKG monitoring of all newborns until there is evidence that this would be a useful, practical, and responsible use of resources and diagnostic strategy. ❖

Electrocardiographic evidence of a prolonged QT interval in newborns:

a. has a 90% association with death from SIDS.
b. should be corrected for heart rate for proper interpretation.
c. differs between boys and girls.

d. would be inexpensive if applied to all newborns.

Anticholinergic Treatment in Asthma

ABSTRACT & COMMENTARY

Synopsis: *Among children with severe exacerbations of asthma, the addition of an anticholinergic, atropine-like agent (nebulized ipatropium) to standard albuterol and corticosteroid therapy significantly decreased the hospitalization rate.*

Source: Qureshi F, et al. Effect of nebulized ipatropium on the hospitalization rate of children with asthma. *N Engl J Med* 1998;339:1030-1035.

Qureshi and associates from the emergency Department (ED) at the Children's Hospital of the King's Daughters in Norfolk, Va., had previously demonstrated that the addition of ipatropium, an anticholinergic drug, to standard albuterol therapy significantly improved the pulmonary function of children experiencing an acute asthmatic attack. Because other small studies did not show a beneficial effect, Qureshi et al designed a large, double-blind, prospective study to determine whether the addition of anticholinergic therapy with nebulized ipatropium to their standard ED therapy with albuterol and corticosteroids would reduce hospitalization rates of children with an acute exacerbation of asthma.

Nearly 500 children, 2-8 years old who presented at the ED with an acute exacerbation of asthma, were enrolled in the study. All children were treated with 2.5-5.0 mg of nebulized albuterol delivered by a face mask every 20 minutes for three treatments. They were given oral prednisone, 2 mg/kg, with the second albuterol treatment. At the time of the second nebulization treatment, the children were randomized to have either 500 mcg of ipatropium or a placebo added to their second and third albuterol nebulization solutions.

The initial severity of each child's episode was rated either by the percentage of the predicted peak expiratory flow rate or an asthma scoring system based on signs and symptoms. Only children with moderate or severe exacerbations of asthma were enrolled in the study.

A total of 434 children—215 in the treatment group and 219 in the control group—completed the study. Except for a slight predominance of girls in the treatment group, there was no significant difference between the groups as a whole or between groups stratified according to the severity of the asthmatic exacerbation. The decision of whether to admit a child to the hospital was made by the attending physician based on objective changes in the measurements of clinical and pulmonary function and according to oxygen saturation (< 94% or > 94% in room air).

Overall, the rate of hospitalization was lower in the ipatropium group (59 of 215 children, 27.4%) than in the placebo group (80 of 219, 36.5%), P = 0.05. For patients classified as severe, the addition of ipatropium significantly reduced the need for hospitalization (51 of 136 treatment children, 37.5% compared to 71 of 135 control children, 52.6%; P = 0.02).

COMMENT BY THOMAS DOLAN, MD, FAAP

This is an excellently controlled study consisting of a control group of 219 patients and an "ipatropium" group of 215 patients. In addition to using peak flow rates that are usually not obtainable before age 5, all patients were assessed using an asthma score consisting of five variables: signs and symptoms, respiratory rate, O_2 saturation, auscultation retractions, and dyspnea.

Both groups of children were treated with nebulized albuterol every 20 minutes for three doses. Two mgm of prednisone or prednisolone, to a maximum dose of 60 mgm, was given orally with the second albuterol treatment. Patients who responded to the first or second dose of albuterol were eliminated from the study, as they were unlikely candidates for hospitalization. Children in the treatment group received 500 mcg of ipatropium with the second and third doses of albuterol. Children in the control group received normal saline with the albuterol. There was an overall 10% reduction in admissions for patients receiving ipatropium, mainly in severe patients (16% reduction).

It makes good sense to consider adding ipatropium to an emergency room protocol for treatment of acute asthmatic attacks. Ipatropium is an anticholinergic, parasympathetic agent that acts primarily on the choline receptors in larger airways. Albuterol is a sympathomimetic agent acting primarily on beta-agonist receptors that are chiefly found in the small airways. In a similar study, Schuh showed that combined albuterol ipatropium therapy greatly reduced hospital admission rates, particularly in more severe patients.[1] Other studies in the literature show that ipatropium is an excellent second-line drug in the treatment of asthma. I would favor earlier use of ipatropium because the longer an attack of asthma lasts, the more difficult it is to stop.

I would suggest that ipatropium inhalation be included in the first nebulization treatment (along with albuterol) in patients who are referred to the ED because they have not responded to 2-3 nebulized treatments at home, as well as to patients in the ED who have shown little or no response

after two treatments of albuterol. Ipatropium is well tolerated with few systemic atropine side effects. One manufacturer is already providing a premixed mixture of albuterol and ipatropium for metered dose inhalers. (*Dr. Dolan is Professor of Pediatric Pulmonology at the Yale University School of Medicine.*) ❖

References

1. Schuh S, et al. Efficacy of frequent nebulized ipatropium bromide added to frequent high-dose albuterol in severe childhood asthma. *J Pediatr* 1995;126:639-645.

The addition of anticholinergic medication to standard therapy for acute asthma:

a. Has a greater beneficial effect if the attack is clinically severe.
b. Appears to affect receptors in the smaller airways.
c. Replaces the need for beta-agonist therapy.
d. Reduces the need for hospitalization by 50%.

Special Feature

Childhood Obesity: Causes, Consequences, and Prevention

By Walter R. Anyan, Jr. MD, FAAP

There is nearly universal agreement that obesity is dramatically increasing worldwide in both adults and children, and that the escalation of obesity in the United States should be an important issue for physicians who care for children. It has been stated that if the current rates of increase in obesity in the United States continue, 100% of the American population will be obese by the year 2020![1] A definition of obesity used by the World Health Organization is the Body Mass Index (BMI; the weight in kg divided by the height in meters squared). This criterion for obesity is not age-dependent and so can also be used for children and adolescents. Incidentally, readers who want the best current reference on BMI in childhood and adolescence will find it in Rosner.[2] Overweight is defined as BMI 25-30 kg/m^2; obesity is defined as BMI greater than 30 kg/m^2. Obesity can also be assessed by measuring the subscapular and iliac skinfolds as an index of trunk fat. BMI provides a useful way of comparing weight with height; the skinfold measurements provide information about subcutaneous adipose tissue mass.

Contrary to what many people believe, childhood obesity is almost never a result of an underlying genetic disorder (Prader-Willi, etc.) or a consequence of CNS or hypothalamic damage. One nearly consistent association with obesity is obesity in the family. There is a strong association between obesity at the time of puberty and obesity in adult life. Another underlying association is the tendency for obese children to be more sedentary than their nonobese peers.[3] Exercise programs have become an important part of strategies to both prevent and treat childhood obesity.[4]

The relationship between television watching and childhood obesity has been the subject of a number of comments.[5,6] TV viewing can be a risk factor for development of obesity by establishing a "vicious circle": TV viewing produces a sedentary lifestyle, sedentary children watch more television, and television exposes children to advertisements for food products that in themselves are generally fattening.[7]

Andersen and associates studied 4063 American children 8-16 years of age who were examined as part of the National Health and Nutrition Examination Survey III (NHANES III) between 1988 and 1994. Data were analyzed relating self-estimates of television watching and vigorous physical exercise with indices of obesity.[8] Although Andersen et al do not present data that quantify food intake, their article does compare self-reported

"exercise that made them sweat or breathe hard three or more times per week" as well as hours of television watched daily with body mass index (BMI) and skinfold (subscapular and suprailiac) thicknesses on the trunk.

In terms of any association with BMI or skinfold thickness in the children studied, hours of daily television watching—or lack thereof—seemed to have more clout than the reported bursts of vigorous physical activity. Eighty percent of subjects recalled meeting the exercise quota. Recall of television watching, an exquisite measurement of inactivity, revealed that while 39% of subjects watched television one hour or less daily, 35% viewed 2-3 hours/day and 26% stayed by their sets four or more hours daily! Vigorous activity levels were lowest in girls, non-Hispanic blacks, and Mexican Americans.

Several findings are particularly interesting. BMI and skinfold thickness were significantly greater in boys who watched more than two hours of television daily and in girls who watched four or more hours daily. However, among boys, BMI also was greater in those reporting 6-8 episodes of vigorous activity per week. When the interaction of vigorous activity and television watching is examined, it appears that the lowest BMI and lowest skinfold measurements were found in boys who had the lowest frequency of vigorous activity (3 or fewer times per week) and the lowest amount of television watching (< 2 hours per day). While the highest BMI was found in those who had the greatest vigorous activity and 2-3 hours of television each day, the boys with the largest skinfold thicknesses had the lowest vigorous activity and the largest amount of television watching. The finding that the group of girls who had the lowest BMI did the least television watching and had 4-5 episodes of vigorous activity per week is similar to the finding in boys, the girls with the highest skinfold measures were those with moderate amounts of vigorous activity and the highest amount of television watching. Interestingly, no subgroup of girls had particularly low skinfold measurements.

Contrary to popular belief, children and adolescents find things to do instead of watching television, and it seems that whatever they do when they don't watch television is apt to be helpful in restraining the progressive increases of BMI and skinfold thickness that occur during this part of their lives. We continue to have every reason to believe that it is far easier to prevent obesity than to treat it. For the pediatrician, the question, "So, how much television do you watch?," may be one worth asking. We should also strongly endorse the objectives of the International Consensus Conference on Physical Activity Guidelines for Adolescents that "adolescents engage in three or more sessions per week of activities that last 20 minutes or more at a time and that require moderate to vigorous levels of exertion."[8] (*Dr. Anyan is Professor of Pediatrics and Chief of the Division of Adolescent Medicine at Yale University School of Medicine.*) ❖

References

1. Kuczmarski RJ, et al. Increasing prevalence of overweight among US adults. The National Health and Nutrition Examination Surveys, 1969-1991. *JAMA* 1994;272:205-211.
2. Rosner B, et al. Percentiles for body mass index in U.S. children 5 to 17 years of age. *J Pediatr* 1998;132:211-222.
3. Cooper DM. Evidence for and mechanisms of exercise modulation of growth. *Med Sci Sports Exerc* 1994;26:733-740.
4. Rössner S. Childhood obesity and adulthood consequences. *Acta Paediatr* 1998;87:1-5.
5. Young BM. *Television advertising and children*. Oxford: Oxford University Press, 1990.
6. Strasburger VC. Children, adolescents and television. *Pediatr* 1992;13:144-151.
7. Andersen RE, et al. Relationship of physical activity and television watching with body weight and level of fatness among children. *JAMA* 1998;279:938-942.
8. Sallis JF, Patrick K. Physical activity guidelines for adolescents. *Pediatr Exercise Sci* 1994;6:302-314.

The prevalence of obesity in adolescents:

a. Is not related to physical activity.
b. Can be estimated by calculation of the BMI in groups of individuals.
c. Is not influenced by ethnic background.
d. Has not changed during the past two decades

In Future Issues:

Screening Adolescent Athletes for Cardiac Disease

Hepatitis C Virus Infections in Pediatrics—Diagnosis and Treatment