Caffeine Consumption in Young Children

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Two hundred twenty-eight surveyed parents reported that their 5 to 7 year old children drank approximately 52 mg of caffeine daily and their 8 to 12 year old children drank 109 mg daily. Caffeine consumption and hours slept were significantly negatively correlated, but caffeine consumption and enuresis were not significantly correlated. Spanish-speaking parents reported fewer bedwetting events than their English-speaking peers. *(J Pediatr 2011;158:508-9)*

Caffeine's diuretic properties have encouraged behavioral health practitioners to eliminate caffeine from the diet of children with enuresis.[1] The Food and Drug Administration has not developed pediatric guidelines for caffeine consumption, but[2] Canadian guidelines recommend that children aged 4 to 6 years old consume no more than 45 mg/d, approximately equivalent to the amount of caffeine found in a 12-ounce can of cola.[3] Canadian guidelines for 7- to 9-year-old and 10- to 12-year-old children are higher, with upper limits of 62 mg/d and 85 mg/d, respectively.[3] The most recent caffeine consumption data for children living in the United States is almost a decade old,[4] and most of this research has been conducted with older children, adolescents, and adults.[5] To obtain current caffeine consumption data for children and examine the relationships between caffeine, enuresis, and sleep, we surveyed parents of young children. Our sample also permitted a preliminary examination of cross-cultural differences in caffeine consumption by Spanish- and English-speaking children.

Method

A convenience sample of 228 English-speaking and Spanish-speaking families was recruited from an urban outpatient pediatric clinic. Parents of 5- to 12-year-old children were surveyed regarding their child's caffeine consumption during routine clinic visits. Respondents reported their child's average daily consumption of various beverages and snacks, emphasizing those that contained caffeine. Parents indicated whether a child consumed an item and reported how many servings, and of what size, were consumed per day. Illustrated depictions of serving sizes were provided to help parents report accurate data. The survey also included items that explored enuresis and sleep history. Exclusionary criteria included children with a known sleep disorder or a medical diagnosis that might account for bedwetting; however, no surveys were discarded because of these criteria. Twenty-seven surveys were discarded as incomplete, resulting in 201 surveys for analysis.

Data Analysis

Data were evaluated with SPSS (SPSS, Inc, Chicago, Illinois).[6] Pearson correlations were calculated to ascertain the relationship between variables of interest and an independent samples t test was used to evaluate differences between English- and Spanish-speaking children. Finally, a χ^2 analysis was conducted to determine whether membership in one group (wets the bed or not) could be predicted when membership in a second group (caffeine consumer or not) was known. Because very few children consumed a meaningful amount of caffeine through food items, only caffeine consumed through beverages is reported.

Results

Children who consumed caffeine comprised approximately 75% of this sample. Children aged 5 to 7 years old consumed approximately 52 mg of caffeine per day, and children aged 8 to 12 years old consumed approximately 109 mg, on the basis of parental report (Table I). Being male was positively correlated with enuresis at least one night per week ($r = 0.23$, $P = .001$), as was a family history of enuresis ($r = 0.16$, $P = .02$). Age was negatively correlated with enuresis ($r = -0.23$, $P = .001$). The amount of caffeine the child consumed was negatively correlated with the average number of hours the child slept ($r = -0.18$, $P = .02$). Caffeine consumption was not significantly correlated with number of nights the child wet the bed ($r = 0.05$; $P = .49$) (Table II).

The χ^2 analysis of 2×2 group memberships (enuresis and caffeine consumption) was not significant (χ^2 [3, 197] = 0.66, $P = .41$). Consuming caffeine did not predict group membership for enuresis. Children from Spanish-speaking families reportedly wet the bed less frequently (t[198] = 2.07, $P = .04$) and drank less caffeine than their English-speaking peers (t[199] = 1.50 $P = .14$), although this latter finding was not significant.

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Table I. Demographic information

	Ages 5-7 years old (n = 104)	Ages 8-12 years old (n = 97)
Males	58	50
Females	46	47
English-speaking	83	80
Spanish-speaking	21	18
Consumed caffeine	76	78
Wet the bed	27	14
Mean mg of caffeine consumed	52	109
Mean hours slept per night	9.46	8.70

Discussion

Consistent with previous research, older children consumed more caffeine than younger children; however, the amount of caffeine consumed was greater than the 22 to 23 mg/d previously reported.[5] Children in this study consumed two to three times that amount, with older children drinking the equivalent of almost three 12-ounce cans of soda per day. This is almost twice the amount recommended by Canadian guidelines[3] and well above the amount that can create physiological effects in adults.[7]

Similar to previous findings, children with enuresis were more likely to be younger, male, and have a family history of enuresis.[1,8] Surprisingly, caffeine consumption was not significantly associated with enuresis. Children who consumed caffeine were less likely to wet the bed than children who did not drink caffeinated beverages. Therefore removing caffeine from children's diets, although a logical treatment recommendation for enuresis, was not supported by the data.

Regarding the effect of caffeine on sleep, children aged 5 to 7 years old slept an average of 9.46 hours per night. This is above the minimum 9 hours recommended by the Centers for Disease Control and Prevention.[9] However, approximately one in four of these children slept less than 9 hours per night. Older children, aged 8 to 12 years old, slept an average of 8.47 hours per night, which is below the minimum proposed by the Centers for Disease Control and Prevention for this age group.[9] Children from Spanish-speaking families were reported to wet the bed significantly fewer nights per week relative to their English-speaking peers, although they did not consume significantly less caffeine.

Our survey permitted an evaluation of the relationship between caffeine consumption and enuresis as well as provided estimates of caffeine consumption in English and Spanish speaking children. This study did not evaluate causal relationships among these variables. Moreover, there are multiple mechanisms contributory to enuresis, and increased diuresis alone, as a function of caffeine, may not result in enuresis. Furthermore, data were collected in survey form and thus subject to recall and parental bias. In addition, the sample of Spanish-speaking children was of modest size, and cross-cultural comparisons need to be interpreted with care, noting that parental disclosure regarding childhood behavioral health concerns has been reported to differ across cultures.[10] Finally, we have not investigated the specific physiological and psychological effects of caffeine consumption on young children, but, given the potential effects of caffeine on childhood behavior, a screen of caffeine consumption might be beneficial when evaluating childhood behavioral health concerns. ■

Table II. Intercorrelations matrix

	Age	Sex	Language	Hours slept	Heavy sleeper	Wets bed	Family history	Caffeinated drinks
Age	-	0.07	0.04	0.13	0.11	0.23*	0.07	0.18*
Sex		-	0.02	0.04	0.09	0.23*	0.04	0.13
Language			-	0.02	0.01	0.15*	0.11	0.11
Hours slept				-	0.49*	0.21*	0.48*	0.18*
Heavy sleeper					-	0.11	0.53*	0.12
Wets bed						-	0.16	0.05
Family history							-	0.10
Caffeinated drinks								-

*Significant at $P \leq .05$.

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