

Parenting/Adherence/Metabolic Control: Adolescents with Type 1 Diabetes

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Diabetes is one of the most common chronic diseases in children and adolescents in the United States and currently affects around 151,000 people under the age of 20 (Centers for Disease Control [CDC], 2005a). Extensive research has documented the importance of tight metabolic control in preventing long-term complications of diabetes in young people (Diabetes Control and Complications Trial Research Group [DCCT], 2002; UK Prospective Diabetes Study Group [UKPDS], 1998). Establishing tight metabolic control has been most strongly correlated with adherence to certain self care behaviors including dietary restrictions/monitoring, regular exercise, frequent blood glucose monitoring/recording, and insulin injections/dosage adjustments based on dietary intake/physical activity levels (Hanson et al., 1995).

If children are diagnosed with type 1 diabetes when they are very young, parents must perform most of this self-care; however, as children reach adolescence, parents often shift full responsibility for diabetes management to the child. Unfortunately, in many cases, adolescent developmental psychosocial needs (i.e. increased independence, peer approval, etc.) directly conflict with performing these self-care behaviors. Nevertheless, studies suggest adolescents whose parents maintain some guidance and supervision in the management of diabetes have better metabolic control (Follansbee, 1989; Grey et al., 1998), most likely due to improved adherence to self care measures when parents are involved. On the other hand, parental involvement in diabetes management can be grounds for conflict; thus having a negative impact on parent-adolescent relationships and correlating positively with poor metabolic control (Seiffge-Krenke, 1998).

Certainly, many factors are likely to influence an adolescent's ability to adhere to self-care recommendations and experience good metabolic control. One of these factors may be the parenting style use in interacting with their children. Therefore, the purpose of this study is to evaluate the relationship among fathers' and mothers' parenting styles, adolescent adherence to self-care behaviors, and metabolic control (as measured by hemoglobin A₁C values) in adolescents diagnosed with type 1 diabetes.

Sample. The 29 families included in the study lived in the Intermountain West and were recruited from families who took part in diabetes summer camps, attended the Diabetes Management Clinic at a local hospital, and through snowball referrals. Most were Caucasian and came from two parent homes. The mean age of adolescent participants (14 males, 15 females) was 14.1 years; the mean length of time with diabetes was 6.25 years.

Measures and procedures. Mothers and fathers independently completed the Parenting Practices Report, a 62-item instrument developed by Robinson, Mandleco, Olsen and Hart (1995), to measure parenting practices (authoritative, authoritarian, and permissive). Cronbach alpha scores analyzed for each of these subscales in this study are .91 (authoritative), .87 (authoritarian) and .75 (permissive) for the mothers and .88 (authoritative), .86 (authoritarian) and .75 (permissive) for the fathers. The adolescents' four hemoglobin A₁C values drawn prior to the time consent was obtained were averaged to determine the mean A₁C value. Adolescents completed the Diabetes Self-Care

instrument, a 12-item self-report measure assessing four areas of diabetes self management (diet, exercise, blood glucose monitoring, and insulin injection) over the previous 7 days. The Chronbach alpha score for this instrument was .79.

Results. Results indicated parents had high tendencies toward authoritative parenting; the adolescent participants had an average A₁C of 8.5% (target A₁C recommended by the American Association of Diabetes is < 7.5 %), and an overall adherence mean score of 4.93 corresponding to a rating somewhere between 4 (About half the time) and 5 (Usually) for overall adherence, but closer to 5 than 4. Adherence means for each of the 12 items in the Diabetes Self-Care instrument ranged from 3.35 (eating a low fat diet), to 6.15 (adjusting the amount of insulin I take when I eat a lot).

Preliminary correlations were performed to determine if relationships existed among hemoglobin A₁C values, adherence to self-care behavior, length of time with diabetes, gender, and the age of participating adolescents. No significant relationships were found among any of these variables including hemoglobin A₁C values and adherence to self-care behaviors.

A second set of correlations were calculated to determine the relationships between each parenting style, hemoglobin A₁C values, and adherence to self care behaviors. Authoritarian parenting was not significantly correlated with either overall adherence or hemoglobin A₁C. Adolescents' A₁C values were positively related with the permissive parenting of mothers ($r = .36$) and fathers ($r = .40$). For mothers, authoritative parenting was positively correlated with overall adherence ($r = .64$), but negatively related to A₁C values ($r = -.46$). In addition, mothers' authoritative parenting had more associations with adherence to individual self-care behaviors than any other parenting style; mothers' authoritative parenting was correlated with eating correct amounts and kinds of food ($r = .59$), self-monitoring blood glucose ($r = .44$), giving insulin shots when needed ($r = .66$), checking for urine ketones ($r = .47$), exercising ($r = .36$), and adjusting insulin based on exercise ($r = .46$) and food intake ($r = .54$). Authoritative fathering was significantly correlated with increased adherence to checking blood sugar ($r = .40$), giving insulin shots ($r = .47$), and not skipping meals ($r = .38$). Although authoritarian parenting in general did not significantly correlate with either metabolic control or overall adherence to self-care behaviors, authoritarian mothering had a significant negative correlation with adherence to a low-fat diet ($r = .37$) when the individual adherence items were examined for a relationship to parenting.

In order to assure correlations found between authoritative mothering and the dependent variables of glycemic control and adherence to self-care behaviors were not confounded, regression analyses were performed to control for the possible effects of age and length of time with diabetes. After controlling for age and length of time with diabetes, glycemic control was regressed on authoritative mothering (Table 1). Authoritative mothering accounted for 25 % of the variance in mean A₁C values and was the strongest predictor of glycemic control (Beta = $-.52$; $p < .01$). Adherence to self-care behaviors was then regressed on authoritative mothering, once again controlling for the age of the child and length of time with diabetes. As noted in Table 2, authoritative mothering positively predicted adherence to self-care (Beta = $.63$; $p < .001$) and accounted for 36 % of the variance whereas only 13 % of the variance was accounted for by age and length of time with diabetes combined.

Regression analyses were also performed to further evaluate the relationship between permissive parenting by mothers and fathers and metabolic control. First metabolic control was regressed on permissive mothering, controlling for the age of the child and length of time with diabetes. Permissive mothering was not significantly related with metabolic control (Beta =.39; $p > .05$) and accounted for only 15% of the variance. Next, metabolic control was regressed on permissive fathering, once again controlling for the age of the child and length of time with diabetes. Likewise, the relationship between permissive fathering and poor metabolic control was not found to be significant.

Discussion. This study adds important information to the literature on diabetes generally, and to the literature on adolescents with diabetes specifically. For example, we learned adolescent self care behaviors (as reported by the adolescent) were not related to glycemic control. However mothers' and fathers' permissive parenting styles were significantly correlated with hemoglobin A₁C levels, but only mothers' authoritative parenting style was significantly related to hemoglobin A₁C levels, overall adherence, eating correct amounts and kinds of food, self-monitoring blood glucose, giving insulin shots when needed, checking for urine ketones, exercising, and adjusting insulin based on exercise and food intake.

It is interesting that many correlations were gender specific with authoritative mothering being the strongest predictor of overall adherence and improved metabolic control. The exact reasons for this gender oriented finding are unknown, but many possible explanations can be surmised. In light of historical trends where mothers are the primary caregivers in the home, it is likely children spend more time with mothers as opposed to fathers. Logically, one would assume children will be more likely to be affected by the parenting style of the parent with whom they spend the most time.

Authoritative mothering was highly correlated with almost all of the self-care behaviors, particularly those associated with food. Because of mothers' connections with food, it makes sense mothers would have the greatest impact on the child's dietary self-care behaviors. Finally, because mothers typically bear the brunt of the practical burdens of illness management (Anderson, et al., 1990), they have the potential to be more familiar and knowledgeable about the day to day management of their child's illness in comparison to fathers. For this reason, they may be better equipped to teach their children the diabetes management skills required for special circumstances. This may explain why authoritative fathering was positively correlated with more general diabetes self-care behaviors like giving insulin shots, testing blood sugars and not skipping meals, but not any more specific behaviors that require more knowledge and skill.

The small sample size in this study limits generalizability, and there is a risk of not finding relationships that really do exist because there isn't sufficient power to reveal them (Polit & Beck, 2006). Because study participants were predominately Caucasian, two parent, middle class, and well-educated families, further studies that include participants of different ethnic groups and social economic statuses may be useful. In addition, there was no attempt to control for the type of insulin regimen used by each participant. To more accurately reflect the true strength of the relationship between parenting style and metabolic control, future studies should attempt to control for this variable. Finally, since this is correlational research, there may be a possibility that adherence contributes to authoritative parenting, rather than authoritative parenting

predicting adherence. It could be that children who adhere to the self-care regimens are easier to parent, thus fostering authoritative parenting styles.

Since mother's parenting style had the strongest association with overall adherence to self-care behaviors as well as metabolic control, the bulk of parenting interventions for families with diabetes should include mothers. Because the task of parenting a child with diabetes, especially an adolescent, can sometimes seem overwhelming, it is important diabetes clinicians provide adequate support to these mothers so they can adjust to the responsibilities related to their adolescent with type 1 diabetes and use authoritative parenting styles more than authoritarian or permissive parenting styles.

To be presented at the National Council on Family Relations annual meetings; November 2007; Pittsburgh, Pennsylvania