Original Contribution

Psychosocial Risk and Correlates of Early Menarche in Mexican-American Girls

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Mexican-American girls have one of the fastest rates of decline in age at menarche. To date, no study has addressed the role of psychosocial factors on age at menarche in this population. Using data from a longitudinal cohort of Mexican-American girls from the Houston, Texas, metropolitan area recruited in 2005, the authors investigated associations between family life and socioeconomic environment and age at menarche in 523 girls. After adjusting for maternal age at menarche, daughter’s age, and body mass index at baseline, perception of family life environment as conflict-prone was significantly associated with an earlier age at menarche (<11 years). Additionally, there was a 2-fold higher risk (odds ratio = 2.22, 95% confidence interval: 1.12, 4.40) of early menarche among daughters of mothers who were single parents compared with those who were not. Furthermore, girls who matured early had a 2.5-fold increased risk (odds ratio = 2.69, 95% confidence interval: 1.04, 6.96) of experimenting with cigarettes compared with those who had an average-to-late age at menarche (≥11 years). This study provides important information regarding the role of family life environment and single parenting on age at menarche in Mexican Americans. Awareness of the impact of the family life environment and fathers’ absence during the early years should be emphasized when addressing early age at menarche across cultures.

family cohesion; family conflict; menarche; Mexican Americans; single parenting; smoking; social support

Abbreviations: BMI, body mass index; CI, confidence interval; FLQ, family life questionnaire; OR, odds ratio.

Over several decades, the average age at menarche in the United States has declined by 0.8 years in non-Hispanic white girls born from 1980 to 1984 compared with girls born before 1920 (1). During the same time period, Mexican-American girls experienced a greater decline in the mean age at menarche, from 13.2 years to 12.2 years, than did non-Hispanic white girls, in whom the mean age at menarche declined from 13.3 years to 12.5 years (1). Although the decline in age at menarche in non-Hispanic white girls has leveled off, current national data indicate that Mexican-American girls continue to have the fastest rate of decline (2, 3). Furthermore, girls of Mexican-American descent have the highest rate of overweight/obesity, a known predictor of early age at menarche (3–5). Therefore, targeted public health measures aimed at mitigating trends in obesity and mean age at menarche are needed in this population.

An early age at menarche, often measured as onset of menarche before 12 years of age, is associated with both short- and long-term adverse sequelae (6, 7). Accordingly, girls who experience puberty or menarche at an earlier age are at an increased risk of emotional and psychological problems, as well as chronic health conditions (8–11). During adolescence, girls who experienced menarche at an earlier age are 70% more likely to drink alcohol and 50% more likely to smoke earlier than those who began menarche at an average age (12, 13). Furthermore, they tend to suffer from higher rates of depression, anxiety, and negative body image and to initiate sexual activities at an earlier age than their peers (14–16). As adults, girls who matured early are more likely to be shorter, overweight/obese, and at higher risk for cardiovascular disease and breast cancer (10, 17, 18).
Although heritability plays an important role in age at menarche, psychosocial factors such as the quality of early family life environment and father’s absence and/or involvement with the family are associated with an earlier age at onset of puberty or menarche in some but not all studies (19–24). According to Draper and Harpending (25), humans are sensitive to early life experiences and adjust to such experiences by developing behavioral patterns and psychological orientations that can determine their reproductive potential. Specifically, the evolutionary theory of socialization postulates that early life experiences characterized by a variety of stressors that have the potential to influence somatic development could lead to an earlier pubertal timing (26). Because of this, girls growing up in homes with absent fathers or homes characterized by low paternal involvement, parental divorce, or marital conflict tend to enter puberty at an earlier age than their peers who are not affected by such experiences (26).

Potential limitations of the research on psychosocial factors and puberty/menarche include small sample size, nonprobability sampling, and inconsistent source of information about family environment (19–24). For instance, most studies collect maternal report of marital conflict or family disruption, whereas others obtain assessment from both parents; however, very few studies have assessed the role of family life environment from the child’s perception. Moreover, there is a paucity of data on these associations and on the subsequent effect of early age at menarche and smoking experimentation in Mexican-American girls.

The present study aimed to address such limitations by using a population-based sample of Mexican-American girls and a previously validated family lifestyle questionnaire that evaluates girls’ perceptions of their family life environment rather than relying on parental reports. Specifically, this study explores the association between Mexican-American girls’ perception of their family life and socioeconomic environment and age at menarche and subsequent risk of smoking susceptibility or experimentation.

MATERIALS AND METHODS

Study population

Participants were members of the Mexican-American Tobacco Use in Children Study, a prospective, longitudinal cohort study designed to assess the role of demographic, psychosocial, and behavioral constructs on experimentation with smoking among youth of Mexican origin residing in Harris County, Texas. A detailed description of the sampling and recruitment strategy has been published elsewhere (27). Briefly, in 2005, all participants were selected from age-eligible adolescents in households in which adult members had been enrolled since July 2001 in a population-based infrastructure (a prospective cohort study entitled Mano a Mano) created and maintained by the Department of Epidemiology at The University of Texas M. D. Anderson Cancer Center.

All participants in this study were 11–13 years of age at baseline and were followed for 3 or more years until the final home visit. We conducted in-person baseline and final home visits and followed up with the participants every 6 months by telephone to assess smoking susceptibility and experimentation. At the baseline visit, over 90% of all parents with age-eligible daughters who were contacted agreed to enroll their children and consented to their participation in the study. Of those enrolled in the cohort at baseline (n = 672), 88% (n = 590) remained in the study at the final home visit, and 523 girls, aged 14–17 years, had complete information on age at menarche, family life environment, and other covariates. We found no difference in the distribution of age at baseline, birthplace, language spoken at home, or body mass index (BMI, measured as weight in kilograms divided by height in meters squared) among girls who participated in this study compared with those who were excluded. The institutional review board at The University of Texas M. D. Anderson Cancer Center approved all aspects of this study. All patients and their parents provided written informed consent.

Ascertainment of key variables of interest

At baseline, each participant consented to be in the study and completed a 5-minute personal interview regarding age, acculturation, and nativity status (US-born or Mexican-born). Anthropometric measurements and self-reported data were collected at the baseline and final home visits. Measurements for height and weight were taken by trained staff using standard measurement protocols. We used measured height and weight to calculate BMI for age and dichotomized BMI as normal or overweight/obese BMI for age using the 2000 Centers for Disease Control and Prevention <85th and ≥85th percentile cutpoints, respectively (28).

Participants were handed a personal digital assistant to complete a questionnaire regarding smoking status, subjective social status, family and social environments, and outcome expectations at baseline and the final home visit. During the consenting process, all parents were provided samples of questions that would be asked of their children, but they were informed that they would not have access to the responses. Questions regarding body image, age at menarche, perception of body development and sexual maturation relative to peers, and social pressures were added to the personal digital assistant questionnaire for the last home visit. Information regarding parental socioeconomic status (home ownership and educational level), maternal age at menarche, places of birth, and marital status were obtained from interviews with the mothers, all of whom were members of the Mano a Mano cohort (27).

Dependent variables

At the final home visit, each girl reported her age at menarche. First, we used the median age of 12 years as the cutoff for early versus average-to-late age at menarche, whereby girls who had their first menses before age 12 years were classified as having an early menarche and those who started at 12 years of age or later were classified as average-to-late age at menarche. Furthermore, we conducted a comparative analysis using a lower cutoff point of <11 years of age for early menarche to further assess any meaningful
difference in age at menarche by the risk factors. By the final home visit, 27 (5%) girls had not yet experienced menses. We included them in the group classified as average-to-late age at menarche because they were older than 11 years at the time of assessment.

Data collected at the final home visit were used to assess the effect of earlier age at menarche (<11 years) on cognitive susceptibility to or experimentation with smoking by using previously validated measures in Table 1 (29). We used 3 items to assess cognitive susceptibility to smoking. Failure to respond “definitely not” to all 3 items indicated that the respondent was susceptible to cigarette smoking; otherwise, she was considered a committed never smoker. Similarly, a participant who responded “no” to having “ever smoked a whole cigarette” and having “ever tried a cigarette, even a puff” was classified as a nonexperimenter; otherwise, she was classified as an experimenter.

### Independent variables

We measured perception of family life environment at baseline using the Family Life Questionnaire (FLQ) developed by Foxcroft and Lowe (30). This questionnaire consists of 20 items aimed at measuring perception of family life environment in a European population. Responses to these items were scored from 0 to 3, indicating whether the participants strongly disagreed, disagreed, agreed, or strongly agreed with each respective statement. From these items, 5 subscales classifying perception of family life as conflict-prone, authoritarian, expressive, cohesive, or laissez-faire were created by summing the scores from the individual items. Scores ranged from 0 to 12; a higher score on each subscale indicated high family cohesion, high family expressiveness, low family conflict, high family authoritarianism, and a low laissez-faire family lifestyle (30). Internal

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**Table 1. Measures of Family Life Environment at Baseline and Smoking Susceptibility and Experimentation at the Final Home Visit for Mexican-American Girls, 2005–2009**

<table>
<thead>
<tr>
<th>Scale/Measure**</th>
<th>Items in the Family Life Questionnaire (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cohesive (Cronbach’s α = 0.71)</strong></td>
<td>In my family, we really help and support one another.</td>
</tr>
<tr>
<td></td>
<td>In my family, we are full of life and good spirits.</td>
</tr>
<tr>
<td></td>
<td>My family always does things together.</td>
</tr>
<tr>
<td></td>
<td>We really get along well with each other.</td>
</tr>
<tr>
<td><strong>Expressive (Cronbach’s α = 0.20)</strong></td>
<td>My family does not discuss its problems (R).</td>
</tr>
<tr>
<td></td>
<td>In my family, it’s important for everyone to express their own opinion.</td>
</tr>
<tr>
<td></td>
<td>There are a lot of discussions in my family.</td>
</tr>
<tr>
<td></td>
<td>We don’t tell each other about our personal problems (R).</td>
</tr>
<tr>
<td><strong>Conflict (Cronbach’s α = 0.55)</strong></td>
<td>We don’t fight in my family.</td>
</tr>
<tr>
<td></td>
<td>In my family, we hardly ever lose our tempers.</td>
</tr>
<tr>
<td></td>
<td>In my family, we never hit each other.</td>
</tr>
<tr>
<td></td>
<td>In my family, we don’t often criticize each other.</td>
</tr>
<tr>
<td><strong>Authoritarian (Cronbach’s α = 0.51)</strong></td>
<td>Each person’s duty is clearly set out in my family.</td>
</tr>
<tr>
<td></td>
<td>There is strict punishment for anyone breaking the rules in my family.</td>
</tr>
<tr>
<td></td>
<td>“Work before play” is the rule in my family.</td>
</tr>
<tr>
<td></td>
<td>Family members have strict ideas about what is right and what is wrong.</td>
</tr>
<tr>
<td><strong>Laissez-faire (Cronbach’s α = 0.52)</strong></td>
<td>In my family, you can get away with almost anything (R).</td>
</tr>
<tr>
<td></td>
<td>We can do whatever we want in my family (R).</td>
</tr>
<tr>
<td></td>
<td>In my family, we aren’t punished or told off when we do something wrong (R).</td>
</tr>
<tr>
<td></td>
<td>We come and go as we want in my family (R).</td>
</tr>
</tbody>
</table>

**Correlates of age at menarche**

<table>
<thead>
<tr>
<th>Cognitive susceptibility to smoking (29)</th>
<th>3 items assess behavioral intentions and peer influence (administered to never smokers only).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coded as “nonsusceptible” if participants responded “no” to “Do you think you will try a cigarette soon?” and “definitely not” to “If one of your best friends were to offer you a cigarette would you smoke it?” and “Do you think you will be smoking cigarettes 1 year from now?”</td>
</tr>
<tr>
<td><strong>Experimentation (29)</strong></td>
<td>2 items assessed experimentation with cigarettes.</td>
</tr>
<tr>
<td></td>
<td>Coded as “nonexperimenter” if participants responded “no” to “Have you ever smoked a whole cigarette?” and “Have you ever tried a cigarette, even a puff?”</td>
</tr>
</tbody>
</table>

Abbreviation: R, reverse coding.

**a** Each scale consists of 4 items coded as 0, 1, 2, and 3 for strongly disagree, disagree, agreed, and strongly agreed, respectively. Summation of items for each scale has a possible minimum score of 0 and maximum of 12.
consistency (reliability) was moderately low (α < 0.60) for all the subscales except for family cohesion (α > 0.70).

Indicators of socioeconomic status included home ownership, marital status, and educational level. Home ownership was reported by the primary member of the household as yes or no. Marital status was used as a proxy measure for father’s absence/single parenting and was dichotomized as “yes” if the mother responded that she was married or living as married and “no” if she was divorced, separated, or had never been married. We classified maternal educational level as less than high school, high school/general education equivalency, and greater than high school.

**Statistical analysis**

We computed P values based on the independent Student’s t test and Pearson’s chi-square statistics for continuous and categorical variables, respectively, to assess differences between girls who started menarche at an early age and those who started at an average-to-late age. We used logistic regression analysis to calculate the crude and adjusted odds ratios and 95% confidence intervals for the relation between perception of family life, socioeconomic environment, and the endpoint, early versus average-to-late age at menarche.

Using stepwise backward elimination, we first assessed place of birth, years in the United States, BMI, and age at baseline as potential confounders for each respective model. Variables remained in the models if their removal resulted in a ≥10% change in the estimated odds ratio or based on a priori evidence in the literature. Models for the relation between the FLQ subscales and age at menarche were adjusted for age and BMI at baseline, whereas models assessing the role of socioeconomic environment were also adjusted for maternal age at menarche. We also present each model further adjusted for maternal age at menarche and marital status; however, these adjustments did not significantly affect the magnitude or statistical significance of the estimates.

We calculated odds ratios and 95% confidence intervals to assess the relation between early age at menarche and cognitive susceptibility to and experimentation with smoking at the final home visit. In this analysis, we excluded 27 girls who had not yet started their menses by the final home visit and all girls who had experimented with smoking (n = 36) or who were classified as susceptible to smoking (n = 92) at the baseline measurements. Each respective model was adjusted for BMI at baseline. Additionally, a lowess plot was generated to illustrate the probability of smoking experimentation by age at menarche adjusted for BMI at baseline. We performed all statistical analyses using Intercooled Stata 10.1 for Windows (Stata Corporation, LLC, College Station, Texas).

**RESULTS**

Overall, the mean and median ages at menarche (range, 7–15 years) were 11.54 years and 12 years, respectively. Of the girls who reported having experienced menarche, 18.5% (n = 92) had started at or before the age 10 years, and ≈25% (n = 131) had started at 11 years of age. By the time they were 12 years of age, over 75% of the girls had experienced their first period (Figure 1). In general, the association between family life, socioeconomic environment, and age at menarche was stronger when using 11 years of age as the cutoff for early age at menarche compared with 12 years of age; moreover, the direction of the association remained consistent even after adjustment for various confounders. Because of this, our primary results were based on early age at menarche defined as first menses before 11 years of age.
Additional characteristics of the mother-daughter dyads are listed in Table 2. Overall, girls who began menarche at an earlier age had significantly higher BMIs ($P < 0.05$) but did not differ by place of birth, primary language spoken at home, years in the United States, or age at baseline from those who started at an average-to-late age. Girls who matured early reported a significantly less cohesive and more conflict-prone family life environment ($P < 0.05$) than did girls who started menarche at 11 years of age or older (Table 2). For mothers of girls who matured early, the mean age at menarche and the proportion classified as single parents were significantly higher than those of mothers of average-to-late-maturing girls; however, no differences between the 2 groups were observed for mean years in the United States or BMI or in the proportion of mothers who were US-born, spoke Spanish as their primary language at home, owned a home, or had greater than a high school education.

Table 3 presents the crude and adjusted odds ratios and 95% confidence intervals of early age at menarche for perception of family life environment and socioeconomic status. Among the 5 subscales on the FLQ, the perception of family life as cohesive or conflict-prone was independently associated with an early age at menarche. Specifically, after adjusting for age and BMI at baseline, girls who perceived their family as more cohesive had a small but significant reduction in the odds (odds ratio (OR) = 0.89, 95% confidence interval (CI): 0.79, 0.99) of starting menarche at an earlier age compared with those who perceived their environment as less cohesive. Conversely, those who perceived their family life environment as conflict-prone had a significant 13% increase in risk (OR = 1.13, 95% CI: 1.02, 1.26) of starting menarche at an earlier age. Further adjustment for maternal age at menarche and maternal marital status had little effect on the association between family life environment and age at menarche.

There was a strong relation between single-parenting and age at menarche; specifically, after adjustment for age and BMI at baseline, girls whose mothers were single parents had a 2-fold increased risk (OR = 2.22, 95% CI: 1.12, 4.40) of an earlier age at menarche compared with those whose parents were
married or living as married. We found no difference in perception of the family environment as authoritarian, expressive, or laissez-faire between girls who started menarche at an earlier age and those who did not.

As shown in Table 4, an earlier age at menarche was positively associated with smoking experimentation but not cognitive susceptibility to smoking. After adjustment for BMI at baseline, girls who had an early age at menarche had more than a 2-fold increase in risk (OR $= 2.69$, 95% CI: 1.04, 6.96) of having experimented with smoking compared with those who had an average-to-late age at menarche. Additionally, Figure 2 shows that the probability of smoking experimentation decreased with increasing age at menarche.

**DISCUSSION**

To our knowledge, the present study is the first to investigate the association between the family life environment and age at menarche in Mexican-American girls. Overall, we found a significant relation between a cohesive and/or conflict-prone family life environment, single-parenting, and the risk of early age at menarche. We also found a very strong association between age at menarche and smoking experimentation. These findings are consistent with prior studies but to our knowledge have not been previously reported among Mexican Americans (8, 12).

The mean age at menarche of 11.54 years in our population was slightly younger than in previous reports of nationally representative samples of Mexican-American girls (1). This lower age at menarche could be due to the higher proportion of overweight/obese girls in our sample or the fact that girls in our study matured earlier than their national counterparts. Nevertheless, these findings have implications for the declining trend in age at menarche in Mexican Americans, and more studies are needed to confirm the higher rate of overweight/obesity and an earlier age at menarche in Mexican-American girls.

We found no significant association between the selected indicators of socioeconomic status and age at menarche.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Crude OR</th>
<th>Crude 95% CI</th>
<th>Adjusted OR</th>
<th>Adjusted 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of family environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesive</td>
<td>0.87</td>
<td>0.78, 0.98*</td>
<td>0.89</td>
<td>0.79, 0.99*</td>
</tr>
<tr>
<td>Expressive</td>
<td>1.08</td>
<td>0.95, 1.22</td>
<td>1.07</td>
<td>0.95, 1.22</td>
</tr>
<tr>
<td>Conflict</td>
<td>1.13</td>
<td>1.02, 1.25*</td>
<td>1.13</td>
<td>1.02, 1.26*</td>
</tr>
<tr>
<td>Authoritarian</td>
<td>0.97</td>
<td>0.86, 1.10</td>
<td>0.97</td>
<td>0.86, 1.10</td>
</tr>
<tr>
<td>Laissez-faire</td>
<td>0.90</td>
<td>0.80, 1.01</td>
<td>0.90</td>
<td>0.80, 1.01</td>
</tr>
<tr>
<td>Socioeconomic environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home ownership</td>
<td>0.96</td>
<td>0.59, 1.56</td>
<td>0.99</td>
<td>0.61, 1.62</td>
</tr>
<tr>
<td>Single parent</td>
<td>2.41</td>
<td>1.24, 4.68**</td>
<td>2.34</td>
<td>1.20, 4.57**</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>1.17</td>
<td>0.66, 2.09</td>
<td>1.16</td>
<td>0.65, 2.07</td>
</tr>
<tr>
<td>Some high school</td>
<td>0.66</td>
<td>0.37, 1.18</td>
<td>0.67</td>
<td>0.37, 1.20</td>
</tr>
<tr>
<td>Greater than high school</td>
<td>1.00</td>
<td>Referent</td>
<td>1.00</td>
<td>Referent</td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; OR, odds ratio.

$^* P < 0.05$; $^{**} P < 0.001$.

ORs were adjusted for daughter’s age and body mass index at baseline ($n = 523$).

Body mass index was calculated as weight in kilograms divided by height in meters squared.

ORs were adjusted for daughter’s age and body mass index at baseline, maternal age at menarche, and marital status ($n = 470$).
Although previous studies have reported inconsistent findings, our findings for educational level, but not household income, were consistent with some of the more robust studies of larger sample size (20, 31). Because fathers were excluded from our study, we were unable to evaluate the effect of paternal educational level on age at menarche. Additionally, given that our study participants were members of low-income households, the homogeneity of our population might not have allowed us to detect significant differences by level of other socioeconomic status indicators, including home ownership.

Studies of non-Mexican-American populations have shown similar associations between maternal marital status (single parenting) and daughter’s age at menarche (23). In general, marital status has been reported to be a measure of early life stability that can potentially affect the age and rate at which girls start their reproductive maturation (9, 21, 32). Thus, our results were consistent with those of studies that evaluated the role of early family life experience, such as father’s absence or family disruption, on age at menarche. In a recent study by Saxbe and Repetti (22), fathers and mothers who reported marital conflict were more likely to have a daughter who started menarche at an earlier age than were those who reported no such conflict. However, future research should place more focus on not only the presence of the father but also the quality of the marital relationship.

On the basis of responses to the FLQ, we found that girls who perceived their family environment as more cohesive and/or less conflict-prone were less likely to experience an earlier age at menarche than were girls who did not. These findings were consistent with the evolutionary theory of socialization by Belsky et al. (9), which states that adverse early rearing environment and lack of parental investment can serve as stressors that have the potential to alter or accelerate pubertal events. In contrast to other studies, our findings were based on the girls’ perception of their family environment and hence provided a different, more relevant point of view (20–22). However, we could not establish whether these perceptions were indicative of early life experiences or more immediate ones.

Previous studies have reported a traditional paternal-oriented culture in Mexican-American families (33); however, limited data are available regarding Mexican-American fathers’ involvement and communication dynamics with their daughters during the early years of life. In our focus-group research, we found that when both parents were present, the fathers observed and shared their views with the mothers, who played a more active role in engaging and communicating with their daughters about pubertal maturation (34). Although single widowed fathers in the focus groups did indicate playing a more progressive role in their daughters’ lives through direct involvement and communication about growth and development, we lacked data on information about communication style or early life dynamics in households with mothers as single parents (34). Such information could help contextualize the role and/or dynamics of the mother-daughter relationship and age at menarche.

Although the present study is the first to assess the role of psychosocial factors on age of menarche in a population-based study of Mexican-American girls, it is not without limitations. Our measurement of family disruption or father’s absence was based on marital status, which does not fully describe whether a mother is married to the child’s father or someone else; however, other studies have shown that male presence, irrespective of the biologic relationship, tends to protect against an earlier age at menarche (24).

Although the subscales on the FLQ were demonstrated to have high reliability in the European population in which the measure was developed (23), with the exception of the cohesive subscale, we obtained a moderately low reliability in our Mexican-American population. Accordingly, it is possible that the low reliability of the subscales contributed to the lack of association between the subscales and early age at menarche. Future studies should focus on validating these measurements in a Mexican-American population. Finally, our sample size was limited when assessing the role of earlier age at menarche on susceptibility to or experimentation with smoking; thus, a larger sample size may be needed to confirm our findings.

Menarche is an important milestone for adolescent girls, and early age at menarche is associated with several short- and long-term adverse outcomes, such as obesity and premenopausal breast cancer (14, 15, 35). To date, there has been limited research in Mexican-American girls regarding the role of psychosocial factors in age at menarche and subsequent sequelae; therefore, our study provides important information regarding the role of family life environment and family structure (marital status) on age at menarche in Mexican-American girls. Although additional research is needed to corroborate our findings, awareness of the impact of the family life environment, as well as fathers’ absence during the early years, should be emphasized when addressing factors contributing to early age at menarche.

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REFERENCES


