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Prevalence and characteristics of medication sharing behavior in a pediatric Medicaid population with asthma

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Few studies have examined sharing or borrowing of non-addicting prescription medications (references 1–6; reviewed in reference 7) and no study has looked at this behavior in patients with asthma. We hypothesized that medication sharing/borrowing would be common in families with children with asthma and be associated with worsened asthma control, and undertook this investigation to describe features surrounding this behavior and examine its effect on adverse asthma outcomes.

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We studied 112 children enrolled from primary care or pediatric pulmonology clinic at the Vanderbilt University site of a larger study regarding barriers to asthma medication adherence. Eligible children were aged 4–11 years, insured under Tennessee Medicaid (TennCare), and carried a chart reviewed physician's diagnosis of asthma, with a controller medication prescribed in the previous year. The child and caregiver completed an interview including an Asthma Control Test (ACT) score (for ages 4–11 years),⁸ and questions about asthma adverse events, asthma controller adherence, and medication sharing/borrowing behaviors.

Medication sharing ("Sometimes patients share medicine that a doctor prescribed with someone else. In the last year, have you ever given your child's prescription medicine for asthma or allergy to someone else?") and borrowing ("In the last year, has your child ever taken a dose of a medicine for asthma or allergy that was prescribed for someone else?") were determined by parental report, using questions modeled on those utilized in previous studies.^{3,6,7} We examined, by sharing/borrowing status, subjects' ACT scores, reported emergency department (ED) or asthma acute care visits in the past 6 months, rescue inhaler usage, and reported asthma controller medication adherence in the past week. Parents provided written informed consent, and the protocol was approved by the Institutional Review Board of Vanderbilt University.

A total of 112 children were studied. The cohort was 52% African-American, 29% white, 3% Asian, and 14% other or >1 race; 20% were of Latino ethnicity. The cohort had a slight male predominance (64%), and mean age was 7.8 years (range 4–11 years). Sixty percent of families had yearly income <\$20,000, and 92% had yearly income <\$40,000.

Parents of 18 children (16%) reported that their child either shared or borrowed prescription asthma or allergy medication in the preceding year; parents of 13 children (12%) reported borrowing someone else's medication, and parents of 11 children (10%) reported sharing their child's medication with someone else. (Table 1) The most common medications to share/borrow were short acting beta agonists (SABA), leukotriene antagonists, inhaled corticosteroids (ICS), and inhaled corticosteroid-long acting beta agonists (ICS-LABA); no subjects reported sharing/borrowing antibiotics or oral corticosteroids. Sharing/borrowing among siblings or with other family members accounted for nearly all reported instances. Reasons cited for sharing/borrowing medication are listed in Table 1.

Among those who shared/borrowed asthma/allergy medication, median ACT (interquartile range) was 17 (13.2–21.5) compared with 20 (17–22) among those who did not share/borrow, $p=0.14$ (Table 2). Among those who shared/borrowed, 67% had an ACT ≤ 19 (suggesting uncontrolled asthma⁸) compared with 43% of those who did not share/borrow, $p=0.066$. Rate of reporting one or more ED or acute care visits for asthma in the previous 6 months, and reported usage of rescue inhalers in the previous 14 days, did not differ by medication sharing/borrowing status. Finally, there was no difference by sharing/borrowing status in reported adherence to asthma controller medications over the week preceding the survey (median reported usage of ICS, ICS-LABA, and leukotriene modifier medications among those who did and those who did not share/borrow was 7 out of 7 days).

Asthma is a major cause of childhood morbidity, and disproportionately affects disadvantaged persons, including minorities and those of low socioeconomic status.⁹ A factor that has not been studied previously that might influence asthma outcomes is sharing or borrowing of prescription asthma and allergy medications. Among a population of Medicaid-enrolled children with asthma, 16% of families reported engaging in this behavior in the year preceding the survey. Nearly all sharing/borrowing was among family members, particularly between siblings, and most frequently involved rescue inhalers and asthma controllers. Previous studies^{2,4,6-7} of non-recreational medication sharing/borrowing found that one-time or short duration medications (e.g. antibiotics, oral antihistamines, pain medications) were most frequently shared; interestingly no family reported sharing/borrowing antibiotics or oral corticosteroids. This may relate to the cohort being of lower socioeconomic status, since previous studies of medication sharing have suggested that young adult, white, more educated individuals comprise the group that feels most competent to self-medicate.⁶

For reasons that likely include that the cohort is of low socioeconomic status and most subjects qualify for free or very low co-pay prescriptions¹⁰, asthma and allergy medication sharing/borrowing was somewhat less frequent than in previous studies, impacting our ability to detect differences in asthma control and controller medication adherence. There was a trend toward decreased ACT and a higher proportion with ACT ≥ 19 among those who shared/borrowed medication, although not significant at the 0.05 level.

This study has several limitations. First, sharing/borrowing behavior, asthma adverse events, and controller medication adherence were based upon parental report. Language validating sharing/borrowing behavior was included in the questionnaire ("Sometimes patients share medicine..."), and questions were modeled on those used in previous studies^{3,6,7} that have examined medication sharing/borrowing, but it is likely that this practice is underreported. Asthma controller medication adherence was likely overreported, and future studies may benefit from inhaler dose counters or other confirmatory measures. Regarding asthma adverse events, a validated objective measure of asthma control (ACT) was included, and questions about sharing/borrowing were asked last, to minimize recall bias. Finally, this study was intended to be primarily descriptive about the prevalence and features of medication sharing/borrowing among children with asthma, and the sample size did not allow for detection of small differences in asthma control.

Nevertheless, this is the first study to our knowledge to examine prescription asthma and allergy medication sharing/borrowing among any population with asthma, and suggests that this is a relatively common issue, even when self-reported. Future studies should examine the prevalence of this practice among other populations of asthmatics, and define whether this practice impacts asthma control and asthma controller medication adherence.

Abbreviations

ACT asthma control test, ED, emergency department, ICS, inhaled corticosteroid, ICS-LABA, combination inhaled corticosteroid-long acting beta agonist, SABA, short acting beta agonist

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Table 1

Features of asthma and allergy medication sharing/borrowing in the preceding year among 18 asthmatic children whose parent reported this behavior.

Characteristic	N (%)
Number of times medication shared or borrowed among 20 reported instances of sharing or borrowing	
Once	9 (45)
Twice	5 (25)
>2 times	6 (30)
Type of medication shared or borrowed among 27 reported instances *	
ICS	3 (11)
ICS-LABA combination inhaler	2 (7)
Leukotriene inhibitor	5 (19)
SABA	16 (59)
Oral antihistamine	1 (4)
Nasal corticosteroid, nasal antihistamine, oral corticosteroid, or antibiotic	0 (0)
Person who shared or borrowed the medication, among 23 reported instances *	
Sibling	12 (52)
Parent	3 (13)
Other family member	5 (22)
Friend or family member of friend	3 (13)
Reason for sharing/borrowing, among 23 reported instances *	
Has the same medical problem (asthma)	13 (57)
Was sick/it was an emergency	4 (17)
Had a prescription but ran out	4 (17)
Didn't have inhaler with him/her	2 (9)

* Multiple options may be checked

Table 2

Measures of asthma control by asthma/allergy medication sharing/borrowing status.

	Shared or borrowed, N=18 (16%)	No sharing or borrowing, N=94 (84%)	p value[*]
Number of days rescue inhaler used out of last 14, median (IQR)	2.0 (0–4)	2.0 (0–7)	0.49
Any asthma acute visit in last 6 months, N (%)	7 (39)	43 (46)	0.57
Asthma ED visit in last 6 months, N (%)	3 (17)	24 (26)	0.42
ACT score, median (IQR)	17 (13.2–21.5)	20 (17–22)	0.14
ACT 19, N (%)	12 (67)	40 (43)	0.066

* The chi square test was used for comparison of proportions, and the Wilcoxon test for continuous variables. IQR: interquartile range (25th, 75th).