Compliance With Prescription Filling in the Pediatric Emergency Department

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Objectives: To determine the rate of compliance with filling of prescriptions written in a pediatric emergency department and to examine the reasons for not filling the prescriptions.

Design: Compliance with filling prescriptions was determined using a follow-up standardized telephone questionnaire, designed so that it was not obvious that assessing prescription filling was the major reason for the study. Compliance herein was defined as having the prescription filled on the same or next day of the pediatric emergency department visit.

Setting: Pediatric emergency department of a tertiary care hospital.

Subjects: Pediatric patients discharged home with a drug prescription.

Main Outcome Measure: The proportion of prescriptions written in the pediatric emergency department that were filled on either the same or next day as determined by telephone follow-up. This outcome is expressed as a proportion with 95% confidence interval.

Results: Follow-up was completed in 1014 (83%) of the 1222 children, aged $4.5 \pm 4.2$ (mean \pm SD) years. Compliance with prescription filling was 92.7% (940/1014). Parental reasons for not filling the prescription included medication unnecessary (27%), financial (6.8%), and not enough time (6.8%). Dissatisfaction with the explanation of the medical problem, instructions for treatment, and instructions for follow-up treatment were significantly associated with noncompliance by univariable logistic regression ($P < .05$).

Conclusion: The rate of prescription nonfilling in children seen in a pediatric emergency department is at least 7%, although lower than that in adults in a similar setting.


Compliance, which is most commonly defined as the extent to which a person’s behavior for medications, following diets, or executing lifestyle changes coincides with medical and health advice,\(^1\) is an important determinant of the effectiveness of drug therapy. Nonadherence with pediatric drug therapy seems to be a common and important problem, with studies in children suggesting an overall drug noncompliance rate of approximately 50%.\(^2\) Most studies on compliance have concentrated on whether patients take their medications. However, it is critical to determine whether patients actually have their prescriptions filled, because the first step in compliance with therapy is to actually obtain the medication.

A few studies have examined the rate of prescription filling in the primary care or medical clinic setting and have found nonfilling rates of 5% to 20%.\(^3,7\) Even less information is available about patient compliance with having prescriptions written in the emergency department filled with nonfilling rates of 22% and 12% having been reported in primarily adult studies.\(^8,9\)

The objective of this prospective study was to determine the rate of compliance with filling prescriptions written in a pediatric emergency department, a question that has not been studied for this age group. Also the reasons for nonfilling of prescriptions were examined as they may provide clues as to potentially useful strategies to improve prescription redemption and thus enhance compliance with therapy.

RESULTS

Telephone follow-up was completed in 1014 (83.0%) of the 1222 children, aged $4.5 \pm 4.2$ years, who received prescriptions as documented in their pediatric emergency department medical record. One hundred forty-six (14.4% of the total number of cases) adolescents (aged $\geq 10$ years) were included in the analysis.
PATIENTS AND METHODS

The study was conducted in the pediatric emergency department of a regional children’s hospital serving a catchment area of 1.8 million people with 32,000 visits per year. Pediatric patients of all ages discharged from the pediatric emergency department with a drug prescription during a 3-month period January 1, 1997, to March 31, 1997, were considered eligible for enrollment in this study. A few patients (n = 89) from a pilot project conducted in September 1996 using the same method to determine the feasibility of the study were also included. The children were identified by one of us (S.D.) who daily reviewed the pediatric emergency department medical records to identify children who received written prescriptions, excluding over-the-counter medications. All children included in the study were thought by the treating emergency pediatrician to be well enough to warrant a prescription medication. However, their acuity was such that they could be discharged home from the pediatric emergency department.

Telephone follow-up was conducted using a standardized questionnaire. Information regarding the patient’s age, diagnosis, drug prescribed, and the emergency department visit date were recorded before the telephone interview. Initial attempts at follow-up were conducted between 48 and 72 hours after the pediatric emergency department visit. A minimum of 5 attempts was made to contact the patient. The research assistant (S.D.) conducted the follow-up with a parent, except in cases where the child did not live with a parent.

A 13-item telephone follow-up questionnaire was used to determine whether the child (or their parent) had the prescription filled and if not, the reason(s) for not doing so. The questionnaire had been designed so that it was not obvious that assessing prescription filling was the major reason for the study; ie, the questions pertaining to this issue were hidden among other questions. Information was requested as to whether the child had been seen by another physician subsequent to the child’s visit to the emergency department and if another prescription had been received. Questions (requiring an answer of yes/no) were also asked regarding patient satisfaction with the service and information provided in the emergency department.

Compliance with prescription filling was defined as having the prescription filled on the same or next day. The main outcome measure was the proportion of prescriptions written in the pediatric emergency department that were filled within that period as determined by telephone follow-up. This outcome is expressed as a proportion with 95% confidence interval (95% CI). Univariable and multivariable logistic regression (SAS: SAS Inc, Cary, NC) were used to determine the effect of dissatisfaction with the explanation of the medical problem, instructions for treatment, and instructions for follow-up on noncompliance. χ² Analysis and odds ratios with 95% confidence intervals were performed. Unless otherwise stated values are expressed as mean ± SD.

The study protocol was approved by the Review Board for Health Sciences Research Involving Human Subjects at the University of Western Ontario, London.

Of the potential subjects, 130 (10.6%) could not be contacted, most commonly because the telephone was out of service or there was no answer; 78 (6.4%) refused to participate. The mean age of the nonresponders was 4.9 ± 4.7 years. Follow-up was completed 5.1 ± 3.3 days after the pediatric emergency department visit. The questionnaire was completed by the mother in 804 (79.3%) of the cases and by the father in 195 (19.2%) of the cases. These results are consistent with the results of an unpublished survey previously conducted in our pediatric emergency department that found that 72% of children treated were brought to the pediatric emergency department by their mother. Therefore, it would be reasonable to assume that the person answering the questions, the mother, was the person who brought the child to the pediatric emergency department.

Prescriptions were written most often for antibiotics (72.2%) followed by other anti-infective drugs (17.8%), β₂-agonists (14.5%), and steroids (14.0%). The most common diagnosis was otitis media (43.9% of children).

Compliance with having the prescription filled was 92.7% (940/1014) (95% CI, 91.1%-94.3%). Of the other 74 children (7.3%), 17 had their prescription filled at 2 days or longer and 57 did not have it filled. Among the 85 children who received multiple prescriptions (ie, prescription for more than one medication), there was only 1 child for whom only a portion of the prescriptions were filled and this case was considered “noncompliant” for prescription filling. The nonfilling rate in the children prescribed more than 1 drug was 4.7%. Characteristics of the overall noncompliant and compliant respondents are given in Table 1. The most common parental reasons for not having the prescription filled included medication unnecessary (27%), financial (6.8%), and not enough time (6.8%). Most parents in both groups (802/1014, 79%) stated that they had a discounted pharmaceutical plan that covered the cost of their child’s prescription medication.

Dissatisfaction with the explanation of the medical problem, instructions for treatment, and instructions for follow-up were all significantly associated with noncompliance (P<.05, χ² test) (Table 2) with odds ratios of 3.3 (95% CI, 1.9-5.7), 3.5 (95% CI, 1.9-6.7), and 2.3 (95% CI, 1.2-4.1), respectively, by univariable logistic regression. Multivariable logistic regression resulted in odds ratios of 2.3 (95% CI, 1.2-4.5) (P = .01) for dissatisfaction with the explanation of the medical problem, 2.0 (95% CI, 0.95-4.4) (P = .07) for dissatisfaction with instructions for treatment, and 1.3 (95% CI, 0.67-2.7) (P = .41) for dissatisfaction with instructions for follow-up. The contribution of the dissatisfaction with instructions for follow-up to noncompliance was not found to be statistically significant by stepwise logistic regression.

Follow-up care was received by more than one quarter of the patients with 25.1% (255/1014) seen by another physician or professional, 4.6% (47/1014) seen in the pedi-
had their children’s prescriptions filled (97.4% vs 93.2%, emergency department again was higher in the group who or 5, 25th-75th quartiles). However, the proportion of experience, rating the care as 4 (median) of 5 (best) (4 1014) of whom said they would use the pediatric emer-
ting time was “okay.” Parents, 97.1% (985/1014 [71.5%]) thought that the waiting time was “okay.” Parents, 97.1% (985/1014) of whom said they would use the pediatric emergency department again and their parents may not have had time to fill the prescriptions.

Forty-six percent (467 of 1014) of the children initially visited the pediatric emergency department between 4 PM and midnight. The mean waiting time, as reported at the time of the follow-up call, was 53.0 ± 65.0 minutes. Most parents (725/1014 [71.5%]) thought that the waiting time was “okay.” Parents, 97.1% (985/1014) of whom said they would use the pediatric emergency department again, were generally satisfied with their experience, rating the care as 4 (median) of 5 (best) (4 or 5, 25th-75th quartiles). However, the proportion of parents who answered that they would use the pediatric emergency department again was higher in the group who had their children’s prescriptions filled (97.4% vs 93.2%, P = .01).

**COMMENTS**

Drug compliance is important for successful therapy. For an efficacious medication to be effective it must be taken. Noncompliance with therapy seems to be widespread in children, with potentially important implications. Seriousness of the underlying medical condition does not ensure compliance as it has been demonstrated that even children with life-threatening conditions such as cancer are at risk of treatment failure as a result of not taking their medication.11-13

A critical first element in compliance is having the prescription filled. Given the potentially negative consequences of medication noncompliance, it is important to determine the extent of nonfilling of prescriptions in children.

In a study conducted at a neighborhood health center, prescriptions for long-term medications were filled at a higher rate than those for acute illnesses.14 For patients with chronic diseases, it has been estimated that at least 30% of refillable prescriptions are not refilled.15 Although one study conducted in the primary care set-

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**Table 1. Characteristics of Noncompliant and Compliant Respondents**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Noncompliant Respondents</th>
<th>Compliant Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (± SD) age, y</td>
<td>4.9 ± 5.0</td>
<td>4.5 ± 4.2</td>
</tr>
<tr>
<td>Patients with pharmaceutical plan, %</td>
<td>77.0</td>
<td>79.3</td>
</tr>
<tr>
<td>Mean (± SD) rating of care received*</td>
<td>3.8 ± 1.0</td>
<td>4.2 ± 0.9</td>
</tr>
</tbody>
</table>

* Scored on a 5-point Likertlike scale with 5 indicating best experience.

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**Table 2. Dissatisfaction in the Noncompliant and Compliant Respondents**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Noncompliant Respondents</th>
<th>Compliant Respondents</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions for treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explanation of medical problem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructions for follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n = 74)</td>
<td>20 (27.0)</td>
<td>95 (10.1)</td>
<td>.001</td>
</tr>
<tr>
<td>(n = 940)</td>
<td>14 (18.9)</td>
<td>59 (6.3)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>15 (20.3)</td>
<td>95 (10.1)</td>
<td>.007</td>
</tr>
</tbody>
</table>

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...ting suggested that age was an important factor with a greater proportion of prescriptions being filled in the 15 years and younger age group, most studies have included mainly adults. In a survey study, conducted by the Upjohn Company, Kalamazoo, Mich, reasons given by patients with unfilled prescriptions were that they either did not need the medication or did not want to take the medication.

Patient compliance with having prescriptions obtained in the emergency department filled has been determined in an American study, primarily of adults, which found that 22% of patients failed to fill 1 or more prescriptions at the time of follow-up. Although insufficient funds were cited as the reason for not having filled the prescription in one third of the cases, no difference was noted between the payer groups in the frequency of this explanation.8 Compliance with prescription filling was examined as part of The Emergency Department Quality Study that included adults who reported any of 6 chief complaints.9 Of the patients who were advised to take a medication, 12% reported that they did not obtain the medication. Significant independent correlates of not filling prescriptions were lack of medical insurance and dissatisfaction with discharge instructions.9 In our study the proportions of parents with discounted pharmaceautical plans were similar in the compliant and noncompliant groups.

Our results suggest that dissatisfaction with the medical staff’s explanation of the medical problem and less so dissatisfaction with instructions for treatment are important factors influencing compliance with prescription filling by parents and children seen in the pediatric emergency department. Dissatisfaction with instructions for follow-up was not an independent predictor of noncompliance. In the previously described work in adults, dissatisfaction with discharge instructions was determined to be an important factor; however, discharge instructions were not separated into various components as in our study.

Various factors may influence the rate of having prescriptions written in the pediatric emergency department filled. Prescriptions in this setting are more often for acute medical conditions for which the consequences of noncompliance may be more immediately ominous and may lead to a greater sense of urgency to have the prescription filled. However, the emergency physician is generally unknown to the patient who may ques-
Limitations of this study include that the results depend on the accuracy of reporting at the time of the telephone follow-up. Although it is possible that in a few cases compliance may have been reported when in fact the prescription had not been filled, it is unlikely that the parent or child would have answered that they had not filled the prescription when they had indeed done so. We were unable to obtain follow-up information in 17% of eligible subjects; however, it is reasonable to assume that the prescription nonredemption rate may have been even higher in the group that was unreachable or refused to participate. Thus, the potential limitations, if significant, would have lead to a false lowering of the rate of prescription filling noncompliance which would actually have been even higher than that reported.

The rate of prescription nonfilling in children seen in a pediatric emergency department is at least 7%, although lower than that in adults in a similar setting. Physicians should consider this possibility and ask about prescription filling and other compliance during the follow-up visit. The results of this study suggest that an effective strategy for improving prescription compliance in the pediatric emergency department may need to include education of the parent (and child) by the physician as to the medical problem, the need for the medication, its anticipated benefits, and a realistic discussion of potential side effects, perhaps in the form of an improved discharge instruction sheet.

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REFERENCES


