Records, Recall Loss, and Recall Bias in Pregnancy: A Comparison of Interview and Medical Records Data of Pregnant and Postnatal Women

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Abstract: To determine the agreement between interview-based and medical records data concerning illnesses and medications early in pregnancy, we compared the interviews of 202 women with the ongoing records collected during their pregnancies. Substantial underrecording of most transient illnesses was found. Fewer short-term illnesses were reported by postpartum women than still-pregnant women, suggesting the potential for recall bias or loss. (*Am J Public Health* 1989; 79:78–80.)

Introduction

Collection of data about the occurrence and timing of pregnancy events is fraught with potential problems in reliability. If a case and control group are compared, recall bias occurs if there is differential reporting by mothers of affected infants versus those of "healthy babies." Although a standard medical record, collected prospectively throughout pregnancy, may yield unbiased data, a recent comparison of medical records and women's reports of intrapartum events questioned whether the medical records are accurate.[1]

This paper compares self-reported data from still-pregnant and postpartum women with records data on potentially important events which occur during early pregnancy: medication use and history of transient illnesses.

Methods

The data presented derive from a sample of women from two control groups used in a larger study of risk factors for spontaneous abortion.[2] Three hospitals participated in the study between January 1984 and April 1985; these hospitals were the only three hospitals in a city of over 600,000 people which provided both emergency and routine obstetrical care. Overall response rate was 87.4 per cent for contacted prenatal women and 87.5 per cent for postnatal women in the larger study. In this report, the postnatal group consisted of women still in one of the three study hospitals following delivery of a normal infant. The prenatal group consisted of women less than 25 weeks pregnant, whose names were drawn from prenatal case lists provided by physicians admitting to one of the study hospitals, and matched by age (within five-year intervals) and parity (0, 1, 2+). "Late attenders" are thus not represented in this sample; 94.6 per cent of our entire group attended for care before the 16th week of gestation.

All women were interviewed regarding specific periconceptual exposures occurring up to four months following the last menstrual period. In addition to direct open-ended questions regarding exposure to short-term illnesses and medications, probes were used as "examples." For short-term illnesses, the probes included "colds, the flu, bladder infections, measles, mumps, other infections, etc.;" for medications the probes included "prescriptions, aspirin, cough medications, antinausea pills, cold medications, allergy preparations, vitamins, laxatives, etc."

At the end of the study, an abstractor who was unaware of the information on the original interview searched the hospital records of 101 pairs of prenatal and postnatal women. All hospital records contain a copy of the standard outpatient prenatal record form, which is filled out on an ongoing basis throughout the pregnancy by the attending physician and submitted to the hospital before delivery. This form contains information on past medical and drug history, and a record of each prenatal visit and problems discussed therein. Specific questions about vaginal bleeding and nausea appear on the form. For the women still pregnant at time of interview, prenatal forms were accessed after their delivery. However, only entries which covered the time up to and including the interview date were included in the analysis. Concordance was recorded only if interview and chart information agreed in the number and types of reports. Broad classifications of illnesses or drugs were used and exact concordance of proprietary names was not required.

We computed kappa values to compare the data abstracted from the prenatal hospital records with the interview data.[3] We also compared the 71 pregnant women who were interviewed after the sixteenth week of pregnancy, to their matched postnatal controls, calculating the differences in proportions and 95 per cent confidence intervals.[4] A matched analysis using binomial probabilities yielded similar findings and is not presented here.

Results

Health complaints were common during the first four months of pregnancy, but agreement between interview data and chart data was poor, with no kappa values exceeding 0.24 (Table 1). The major portion of agreement in all cases came from the absence of a complaint on either data source; positive concordance was much less common.

The interviews revealed a higher proportion of potentially infectious or febrile events than did the charts, but the charts reported more vaginal bleeding and nausea. For medication use, crude agreement was highest for prescription drugs.

When the interview histories of the first four months of pregnancy, as given by pregnant and postnatal women are compared, a pattern of more complete reporting of nausea/vomiting, upper respiratory infections, and flu/febrile illnesses by still-pregnant women is seen (Table 2). The pooled data of all short-term illnesses indicates more overall reports by still-pregnant women. For medication use, however, the difference between exposure reports by pregnant versus postnatal women is inconsequential in all categories.

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TABLE 1—Agreement between Chart and Interview for Short-term Illness and Medication Reporting

	Source of Report						
	Interview Only	Chart Only	Both	Neither	Crude* Agreement	kappa¶	Interview: Chart Ratio†
Short-term Illness							
Upper respiratory infection/symptoms	45	2	3	152	76.7	.07	9.60
"Flu-like" or febrile illness	25	2	4	171	86.6	.19	4.83
Nausea/vomiting	8	34	5	155	79.2	.11	0.33
Vaginal spotting/ bleeding	2	26	3	171	86.1	.14	0.17
Other complaints	7	13	4	178	90.1	.24	0.65
Medication Type							
Prescription drugs	12	10	13	167	88.6	.48	1.09
Over-the-counter drugs	65	4	3	130	65.8	.02	9.71
Vitamins/supplements	88	11	82	21	51.0	.07	1.83

*Crude Agreement = [number of instances of reports on both records + number of instances of reports on neither record]/total number studied.
¶Kappa value is a measure of agreement beyond that which would be expected to occur by chance. A maximum value for kappa is 1.0; levels below 0.4 are generally taken to indicate poor agreement.
†Interview: Chart Ratio = number of instances of positive reports on interview/number of instances of positive reports on chart.

Discussion

It has been noted that a high proportion of women interviewed one to 15 months postpartum fail to give drug and intermittent illness history identical to that recorded in an interview at five months' gestation.[5] Agreement between birth certificates and mother's reports of time of onset of prenatal care is concordant for month in only 44 per cent of cases,* and concordant for trimester of onset in 88 per cent for White subjects,[7] with mothers tending to report earlier care than the certificates. Distant recall of drug use in past pregnancies has been found to be poor even for prescription drugs.[7] Some have suggested that, because this recall error (i.e., loss) can create inaccurate results in retrospective studies, "studies of past discontinued drug use must, in most instances, rely on prerecorded, reasonably complete documentation of use."[8]

This study used prospective ongoing records, and yet revealed systematic and substantial underrecording of infectious or flu-like illnesses, and of vitamins and over-the-counter drugs. Possible explanations for these failures to record information include:

- The woman may judge that such events as short-term febrile illnesses or use of over-the-counter drugs are too insignificant to report to a physician. This also implies that physicians do not specifically ask for this information.
- Physicians may feel that only those items known to be detrimental to pregnancy should be regularly recorded. More closed-ended questions (such as those on nausea and vaginal bleeding in this study), supplemented by open-ended ones, might improve recording practices.

Women who were still pregnant at the time of the

*Forrest JD, Singh S: Reporting of Prenatal Care in the National Natality Survey, the Vital Statistics, and the National Survey of Family Growth. Presented at the American Statistical Association Meetings, August 1985.

TABLE 2—Comparison of Reported Exposures to Medications or Short-term Illnesses Between Prenatal Women vs Postnatal Women

	Reported on Interview					
	Prenatal Women (N = 71)		Postnatal Women (N = 71)		Estimated Difference in Proportion (%)	95% CI for Difference in Proportion
	n	%	n	%		
Short-term Illness						
Upper respiratory infection	24	33.8	13	18.3	15.5	(1.3, 29.7)
"Flu" or febrile illness	13	18.3	5	7.0	11.3	(0.5, 22.1)
Nausea/Vomiting	8	11.2	1	1.4	9.8	(2.0, 17.7)
Vaginal spotting/bleeding	2	2.7	1	1.4	1.3	(−3.3, 6.1)
Other	5	7.0	5	7.0	0.0	(−8.4, 8.4)
Total reports cited*	52	14.6	25	7.0	7.6	(3.1, 12.1)
Medication type						
Prescription drugs	13	18.3	10	14.1	4.3	(−7.9, 16.3)
Over-the-counter drugs	31	43.7	22	31.0	12.7	(−3.1, 28.4)
Vitamins/supplements	60	84.5	58	81.6	3.1	(−9.5, 15.1)
Total reports cited*	104	48.8	90	31.0	6.5	(−2.9, 16.0)

*Represents total of illness classifications cited. Total denominator for short-term illness is 355 (5 complaints categories for 71 women); for medications is 213.

interview reported short-term illnesses, but not medication use, more frequently. This could reflect bias if symptomatic women were more likely to appear for prenatal care before the sixteenth week of pregnancy. However, because 94.6 per cent of our total postnatal study sample had appeared for care before 16 weeks' gestation, such a bias is unlikely. It is more likely that the postnatal women had either forgotten these events or dismissed them once a normal delivery had occurred. Either explanation argues for a potential recall bias to occur if such postnatal controls were used to compare data on early pregnancy exposures with mothers of malformed or seriously ill infants, who may be less inclined to underreport any potentially related event.[9]

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