

COMMENTARY

Valid Responses to ABO Blood Type Question in Self-reporting Questionnaire

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Abstract

This paper reports the sensitivity and specificity of self-reported ABO blood type. Subjects were 283 outpatients who participated in *Helicobacter pylori* eradication program at Aichi Cancer Center Hospital. Excluding seven patients, an ABO blood test was successfully conducted for 276 participants (133 males and 143 females). Only three participants answered their blood type differently from the results of the blood test; one A-type male answered to be with AB type, one B-type male with AB type, and one AB-type male with A type. Nine participants stated that they did not know their ABO blood type. The sensitivity was 98.7% (95% confidence interval, 92.8-100.0%) for 75 O-type individuals, 96.1% (90.3-98.9%) for 102 A-type individuals, 92.9% (84.1-97.6%) for 70 B-type individuals, and 93.1% (77.2-99.2%) for 29 AB-type individuals, when the nine individuals were included. The specificity was more than 99% for any blood type. These findings revealed that self-reported ABO blood type is highly valid for epidemiologic studies.

Key Words: Validity ABO blood type Self-reporting

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Examining the validity of the collected data is important in epidemiologic studies. There are many papers reporting the validity; for past history of diseases by self-reporting (Daly et al., 1994) and parental reporting (Robinson et al., 1997), for physical activity (Jacobs et al., 1993; Chansan-Taber et al., 1996; Suzuki et al., 1998; Iwai et al., 2001), and for diet between a simple method and more detailed one (Willett et al., 1985; Salvini et al., 1989; Jain et al., 1996; Elmstahl et al., 1996; Shimizu et al.; 1999, Egami et al., 1999; Flagg et al., 2000; Tokudome et al., 2001; Tsubono et al., 2001a,b). These studies elucidated that the validity for some factors was quite low, while that for others was quite acceptable for epidemiological studies.

ABO blood type has been reported to be a risk factor of stomach cancer (Moriwaka, 1960; Wynder et al., 1963) and

precancerous gastric lesions (You et al., 2000). To our knowledge, there are no reports on the validity for self-reported ABO blood type. This paper presents the sensitivity and specificity of ABO blood type by self-administered questionnaire among outpatients of Aichi Cancer Center Hospital, where HERPACC (Hospital-based Epidemiologic Research Program at Aichi Cancer Center) is on going (Tajima et al., 2000; Hamajima et al., 2001a).

Subjects were 283 outpatients (138 males and 145 females) aged 39 to 69 years, who participated in *Helicobacter pylori* eradication program at Aichi Cancer Center Hospital between March and December 1999 (Hamajima et al., 2001b). After written informed consent, the participants were requested to complete a questionnaire including ABO blood type and further to provide a 7ml of

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peripheral blood. One patients withdrew the blood donation after completion of the questionnaire. Plasma of three hepatitis virus carriers was not stored, and three samples were not enough for the test of ABO blood type. The remaining 276 samples of 133 males and 143 females were tested, masking the self-reported blood type. Two independent examiners determined ABO type using the same three tubes including plasma of the participants as well as A, B, and O red blood cells, respectively. The results of the two examiners were completely the same for all samples.

Table 1 shows the results of the ABO blood test and self-reported ABO type. Nine participants stated that they did not know their own blood type. Three answered a blood type different from the result of blood test. The sex and age of the twelve participants are listed in Table 2. The percentage was higher in males (7/133) than in females (2/143), though the difference was not significant (Fishers exact test, $p=0.093$). Their age was 51 years or over. There was also no difference in the percentage between the fifties (7/100) and the sixties (5/128). The sensitivity for the self-reporting was calculated according to the results of blood test. It was 98.7% (95% confidence interval by binomial distribution, 92.8-100.0%) for 75 O-type individuals, 96.1% (90.3-98.9%) for 102 A-type individuals, 92.9% (84.1-97.6%) for 70 B-type individuals, and 93.1% (77.2-99.2%) for 29 AB-type individuals, when the nine individuals who did not know their blood type were included. The specificity was more than 99% for all blood types. When the nine participants excluded, 264 (98.9%, 96.8-99.8%) out of 267 participants correctly answered their blood type.

There are several risk factors whose validity of self-reporting seems intuitively high. Under usual situations, date of birth, number of children, age of fathers and current smoking habit, may be the examples of such factors, although the perfectly valid responses cannot be guaranteed for all study subjects. Meanwhile, intake frequencies and amounts of food items are not regarded at such a high level of validity, but possibly usable for examining the association in epidemiology. We wondered whether self-reported ABO blood type was valid or not, when the odds ratio of ABO blood type was estimated in a case-control study. The result

Table 1. ABO Blood Type by Self-administered Questionnaire According to the Results of Blood Test

Blood test	Questionnaire					Sensitivity (%)	Specificity (%)
	O	A	B	AB	Unknown		
O	74	0	0	0	1	75	98.7
A	0	98	0	1	3	102	96.1
B	0	0	65	1	4	70	92.9
AB	0	1	0	27	1	29	93.1
Total	74	99	65	29	9	276	

Table 2. Findings for Twelve Participants who Answered their Blood Type Incorrectly or Unknown.

Sex	Age	ABO Blood Type	
		Questionnaire	Blood test
M	54	A	AB
M	55	Unknown	A
M	55	Unknown	AB
M	56	Unknown	B
M	57	Unknown	O
M	63	Unknown	B
M	64	Unknown	B
M	65	AB	B
M	66	AB	A
M	69	Unknown	A
F	51	Unknown	B
F	57	Unknown	A

of the present study revealed that self-reported ABO blood type was highly valid. As long as ABO blood type is specified, the information is correct enough for epidemiologic studies in Japan.

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