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An Internet-based survey of hepatitis B vaccination status among acupuncturists in Japan

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Abstract

[Introduction] A needle stick injury is one of the most serious concerns among healthcare professionals, including doctors, nurses, laboratory technicians, and others. Acupuncturists are no exception. However, acupuncturists are not included as a target occupation for hepatitis B vaccination in the "Vaccine Guidelines for Healthcare Professionals" published by the Japanese Society for Infection Prevention and Control. Therefore, a questionnaire survey was conducted to estimate the prevalence of acupuncturists who have received hepatitis B vaccination and whether vaccination practices have changed since 1993, when it became a requirement for national examination.

[Methods] We conducted a cross-sectional study among 778 acupuncturists from the Facebook group Liaison Council on Hospital and Acupuncture Clinic Cooperation (LCHACC). A questionnaire was used to survey the subjects about the year they graduated from educational institutions and their hepatitis B vaccination experience. Using categorical analysis, we estimated prevalence odds ratios (PORs) and their 95% confidence intervals (CIs). Furthermore, to estimate Mantel-Haenszel PORs, we stratified the data by medical institution, work status, and educational institution.

[Results] During the study period from August 1 to August 31, 2018, 128 acupuncturists were included in the study from the 778 LCHACC study participants. The vaccination proportion for all participants was 31.8%. A categorical analysis revealed that vaccination status was associated with a POR of 3.29 (95% CI: 0.69-31.31) among individuals who graduated after 1993. Furthermore, when stratified by medical institution work status, the Mantel-Haenszel POR was 3.18 (95% CI: 0.68-14.89). When stratified by educational institution, the Mantel-Haenszel POR was 3.52 (95% CI: 0.73-16.94).

[Discussion] The overall vaccination proportion of participants in this study was 31.8%, suggesting an urgent need for vaccination recommendations for acupuncturists. Those who graduated after 1993 had a higher hepatitis B vaccination POR of 3.29 than those who graduated before 1992. We observed no substantial change in the stratified analyses by medical work status or educational institution.

[Conclusions] It was suggested that there was a difference in vaccination proportion among graduates after 1993 compared with those who graduated before 1992.

Key words: *acupuncture, hepatitis testing, hepatitis B vaccination, guideline, cross-sectional study*

I. Introduction

Injury from a needle stick is one of the most serious concerns among healthcare professionals, including doctors, nurses, laboratory technicians, amongst others. Acupuncturists are not an exception. Previous studies have reported instances of the hepatitis B virus adhering to acupuncture needles after removal[1,2)], indicating a potential risk of infection for both acupuncturists and patients. In fact, outbreaks of hepatitis B linked to acupuncture were reported[3-5)].

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Although some papers have recommended the regular vaccination of acupuncturists against blood-borne diseases3, there is no survey on the vaccination of acupuncturists; only surveys on vaccination are conducted in acupuncture training schools in Japan[6,7]. Unfortunately, acupuncturists are not included as a target occupation for hepatitis B vaccination in the "Vaccine Guidelines for Healthcare Professionals" published by the Japanese Society for Infection Prevention and Control (Second Edition (2014) and Third Edition (2020))[8,9], and adequate measures to vaccinate acupuncturists have not been implemented in Japan. The recommendation for hepatitis B vaccination among acupuncturists was only introduced in 2020 with the revision of the "Safety Guidelines for Japanese Acupuncture and Moxibustion Practice"[10].

Accordingly, we conducted an Internet-based survey to promote the vaccination of acupuncturists against hepatitis B. Our study has the following two aims: First, to estimate the prevalence of acupuncturists vaccinated against hepatitis B. Second, we surveyed acupuncturists who graduated from educational institutions before or after 1993, when the acupuncture license became a national examination. The background for conducting such a survey is that the educational content of acupuncturists has changed significantly since the national examinations began in 1993, with an increase in the number of modern medicine courses and the introduction of mandatory clinical practice[11]. In particular, the addition of public health courses would have had an impact on vaccination education[12]. Therefore, we hypothesized that the proportion of those who received hepatitis B vaccination increased when this educational content changed.

II. Methods

1. Participants

Our survey was conducted from August 1 to 31, 2018, using Google Forms, a free survey service provided by Google, for 778 acupuncturists participating in the Facebook group Liaison Council on Hospital and Acupuncture Clinic Cooperation (LCHACC). This organization was founded in 2013 to promote cooperation among medical institutions and acupuncturists, as well as to acquire knowledge and skills for this purpose. The questionnaire included a section to obtain consent for participation in this study, and the responses to the questionnaire form and the agreement to participate in the study on the questionnaire form were deemed to constitute consent to participate in the study.

The questions included sex, age, prefecture of residence, educational institution, year of graduation, type of work, treatment location, other medical qualifications, experience in receiving hepatitis tests, possession of antibodies, history of hepatitis B vaccinations, hepatitis B vaccination education experience at an acupuncturist licensing educational institution, hepatitis B vaccination education experience at the place of employment, and if educated at the place of employment, either a hospital, clinic, dental clinic, or acupuncture clinic.

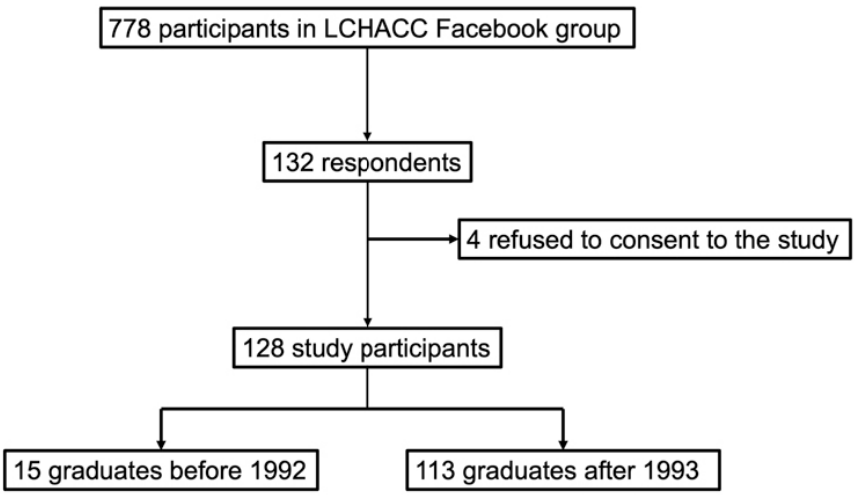

Figure 1: Flow of selection and classification process of the study subjects

III. Results

Of the 778 participants in the targeted LCHACC, 132 responded to the survey. Four of these participants were excluded because they refused to consent, leaving 128 participants for this study (Figure 1). Fifteen participants graduated before 1992, and 113 participants graduated after 1993.

Table 1 shows the characteristics of the participants. Of the study sample, all prefectures had at least one participant, with the South Kanto region having the largest number of participants at 70 (55.1%). The most common type of school graduate was a professional training college, accounting for 110 subjects (85.9%) of the total. Nine (7%) were currently working in a medical institution, and 62 (48.4%) had never worked there, including in the past. In total, 55 (45.8%) of the respondents with other medical qualifications were anma-massage-shiatsu therapists, followed by 15 (12.5%) judo therapists. Overall, 17 (24.6%) tested positive for hepatitis and had antibodies, and 40 respondents (31.3%) reported having been vaccinated. The possession of other medical qualifications was considered a possible confounding factor.

Figure 2 shows the evolution of vaccination status over time. Of the 15 participants who graduated before 1992, two (13.3%) received hepatitis B vaccinations. Meanwhile, of the 113 participants who graduated after 1993, 38 (33.6%) received the hepatitis B vaccination. The prevalence of vaccination among those who graduated in 1993-1998, 1999-2003, 2004-2008, 2009-2013, and 2014-2018 was 36.4%, 33.3%, 34.5%, 43.5%, and 25.0%, respectively.

Table 2 shows the PORs and their 95% CIs for vaccination status. Compared with those who graduated before 1992, those who graduated after 1993 had a POR of 3.29 (95% CI: 0.69-31.31). When we conducted stratified analyses by medical institution work status or educational institution, MH-PORs were 3.18 (95% CI 0.68-14.89) and 3.52 (95% CI 0.73-16.94), respectively.

The majority of the other medical qualification holders in this study were anma-massage, shiatsu, and judo therapists. Anma-massage-shiatsu and judo therapists, whose educational systems are similar to those of acupuncturists, were not analyzed.

IV. Discussion

The overall proportion of vaccination in all the subjects in this study was low (31.8%), indicating an urgent need for vaccination recommendations for acupuncturists. Acupuncturists were required to receive their clinical training at on-campus facilities; hence, no training was provided for them at medical institutions[14]. Although this situation was improved by revising the educational program in 2017[15], the majority of acupuncturists who are currently qualified have yet to experience clinical training at any medical institution. In addition, acupuncturists are less likely to be employed in medical institutions after graduation (8.1%)[16], and medical institution workers were similar to those in the previous study (7.0%). Furthermore, vaccination education in a workplace was similar for hospital (43.5%) and acupuncture clinic (39.1%). However, "Vaccine Guidelines for Healthcare Professionals" state that vaccination should be given at the time of employment in hospitals[8], so it is possible that the vaccination is given directly rather than through education. Therefore, it is possible that the vaccination education in hospital and acupuncture clinic is similar in prevalence, but in terms of vaccination opportunities, hospital may have

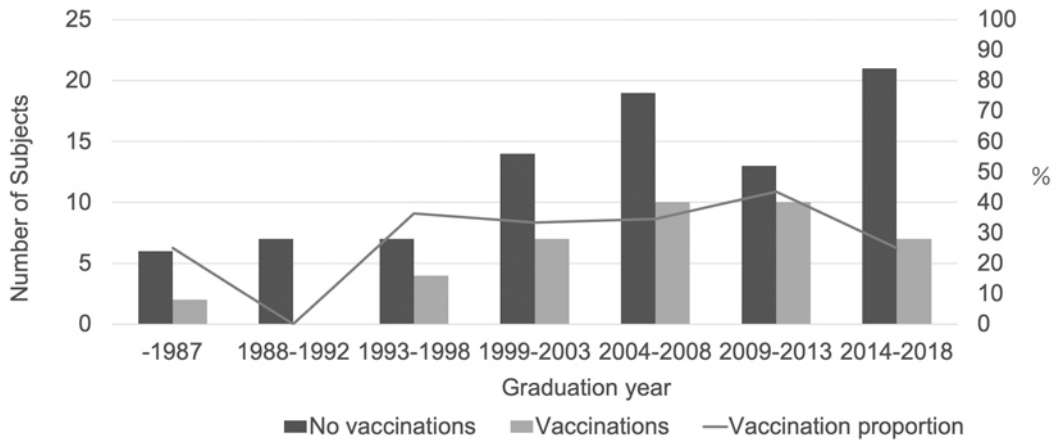

Figure 2: Hepatitis B Vaccination Status Stratified by Year of Graduation

Table 2 Prevalence odds ratio for graduation years after 1993 or before 1992

	Crude	Model 1	Model 2
	POR (95%CI)	POR (95%CI)	POR (95%CI)
after 1993（vs before 1992）	3.29 (0.69-31.31)	3.18 (0.68-4.89)	3.52 (0.73-16.94)

CI: confidence interval
POR: prevalence odds ratio
Model 1: Mantel-Haenszel ORs at stratified analysis by medical institution work status
Model 2: Mantel-Haenszel ORs at stratified analysis by educational institution

more vaccination opportunities than acupuncture clinic because they are vaccinated in accordance with the guidelines. As a result, acupuncturists may have fewer opportunities for vaccination than other medical qualifications.

Those who graduated after 1993 had a higher hepatitis B vaccination POR of 3.29 than those who graduated before 1992. This finding supports the hypothesis of this study that vaccination is altered by education after the start of the national examination. We observed no substantial change in the stratified analyses by medical work status or educational institution. This may suggest that these are not confounding factors in the hepatitis B vaccination, indicating that vaccination promotion for acupuncturists should be conducted for all acupuncturists. Hepatitis B vaccination education at acupuncturist-licensing educational institutions was 20.0% before 1992 and 41.6% after 1993, and vaccination education has been improving since 1993.

In the previous survey, 85.0% of the respondents were male[17], and 66.7% of our study subjects were male. In addition, 78.1% of the respondents in the previous survey were practicing acupuncturists[17], and the corresponding figure was 65.6% in this study. Because the distribution of regions of residence was similar to the previous survey[17], we think that selection bias by region was negligible. Furthermore, regarding vaccination education, 33.1% of schools educated students in the previous survey[16], and the corresponding figure was 39.1% in this study. Based on these results, we believe that our findings can be generalized to the whole nation.

Anti-vaccination is a public health issue in some countries, including Japan. For example, in Canada, complementary and alternative medicine providers are involved in the phenomenon of a growing population that is hesitant to be vaccinated[17]. Complementary and alternative medicine providers with limited experience in vaccinations may be vaccine-averse. In this survey, vaccination prevalence was low at 31.3%, and only 39.1% of acupuncturists received education on hepatitis B vaccination at an acupuncturist-licensing educational institution. This may hinder a proper understanding of vaccines. Acupuncturists are nationally licensed complementary and alternative medicine practitioners in Japan, and for better public health practices, they should be properly managed like other medical qualifications.

There are several limitations to this study. First, the study had a large number of graduates after 1993 and a small number of graduates before 1992. This may be due to the sampling on Facebook. This makes it difficult for this study to accurately determine vaccination trends before 1992. Furthermore, such sampling resulted in a wider confidence interval for estimates for graduates before 1992, which yielded insignificant results. Second, the target group is likely to have a higher level of vaccination awareness than general acupuncturists. Of the 778 respondents, we need to determine the demographics of the 646 who did not respond to the survey. If most responses were from those interested in vaccination, the estimate of the vaccination proportion may be overestimated. Third, we adjusted for the graduation education institutions under the jurisdiction of the MEXT and those under the jurisdiction of the MHLW. However, the educational content differs across graduate schools. Therefore, the confounding bias of graduation school could not be eliminated. Fourth, because the questionnaire survey was conducted via the Internet, we could not reach out to those who did not have Internet access. This may cause selection bias. Finally, recall bias is possible because a questionnaire survey was used, and vaccinators may be more likely to recall events in detail. This could lead to an overestimation of the results. In addition, some vaccination-related questions may be difficult to answer because of a lack of clear memory.

V. Conclusion

Among acupuncturists in Japan, there was a notable difference in the proportion of hepatitis B vaccinations based on graduation year. Specifically, acupuncturists who graduated after 1993 were approximately three times more likely to have received the hepatitis B vaccination than those who graduated before 1992. Given the low proportion of hepatitis B vaccinations, there is an urgent need for

vaccination recommendations among acupuncturists. Further studies are warranted to investigate the factors that may contribute to varying attitudes toward vaccination among complementary and alternative medicine practitioners in Japan, especially those who graduated after 1993.

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Conflict of interest

No competing financial interests exist.

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