



Bidet toilet use and incidence of hemorrhoids or urogenital infections: A one-year follow-up web survey

Teppei Kiuchi ^{a,*}, Keiko Asakura ^b, Makiko Nakano ^a, Kazuyuki Omae ^a

^a Department of Preventive Medicine and Public Health, School of Medicine, Keio University, 35 Shinanomachi, Shinjuku-ku, Tokyo 160-8582, Japan

^b Department of Environmental and Occupational Health, School of Medicine, Toho University, Japan

ARTICLE INFO

Article history:

Received 24 August 2016

Received in revised form 7 February 2017

Accepted 13 February 2017

Available online 16 February 2017

Keywords:

Bidet toilet

Hemorrhoids

Female urogenital infection

ABSTRACT

Although bidet toilets are widely used in Japan, the relationship between habitual bidet toilet use and the incidence of hemorrhoids or urogenital infections has not been prospectively studied.

We performed a web survey and followed bidet toilets users and non-users to assess the incidence of hemorrhoids or urogenital infections from 2013 to 2014. Study subjects were randomly selected from a research company's (Macromill, Inc.) web panel. The baseline survey inquired about toilet use and confounding parameters, and the follow-up survey examined outcome parameters.

A total of 7637 subjects were analyzed using single or multiple logistic regression models. The prevalence odds ratios (ORs) between bidet toilet users and non-users for hemorrhoids, urological infections, and vulval pruritus were significantly > 1.0 but their incidence ORs were not significant. The adjusted incidence OR for bacterial vaginitis symptoms was significant (2.662, 95% confidence interval [CI] [1.315–5.520]).

These findings suggest that positive relations between habitual bidet toilet use and hemorrhoids and urogenital symptoms, except bacterial vaginitis, were due to reverse causation. The incidence of bacterial vaginitis might be caused by bidet toilet use, but the incidence rates were too small to make a definite conclusion, and further studies are needed.

© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

A bidet toilet is a sanitary toilet facility with a warm lavatory seat and a warm water shower to clean the anal or urogenital area after defecation, urination, or menstruation. In Japan, the penetration rate of the bidet toilet use in general households was approximately 77.5% (Cabinet Office, 2015) and it will become popular not only in Eastern but Western countries in the future to improve a quality of life in a rest room.

Some physicians have expressed concern that the habitual use of a bidet toilet causes hemorrhoids or urogenital infection (Ogino et al., 2010; Ogino, 2010; Kohdaira, 2009). However, these studies failed to exclude reverse causation, and the role of habitual bidet toilet use as a cause of hemorrhoids or urogenital infections remains controversial.

Here, to assess the relationship between habitual bidet toilet use and the incidence of hemorrhoids or urogenital infection, we conducted a web survey. A baseline survey was performed in February 2013, and a follow-up survey in February 2014.

2. Materials and methods

This study was approved by the Ethical Committee, Keio University School of Medicine (approval number 20120410).

2.1. Study subjects

The study subjects were selected from among approximately one million people anonymously registered with a leading Japanese website research company's (Macromill, Inc.) web panel. A total of 18,562 people were randomly selected using a computer program, to whom a web survey questionnaire was randomly delivered until the number of respondents exceeded 10,000. A total of 10,305 individuals were involved in the baseline survey.

A follow-up web survey was conducted in February 2014. Among the 10,305 baseline survey subjects, 8255 subjects participated again, whereas 2050 subjects did not reply to the follow-up survey (follow-up rate 80.1%). Of these followed subjects, 618 met exclusion criteria, which included inconsistent answers about "bidet toilet use" at the baseline and follow-up surveys ($n = 407$), age older than 80 years ($n = 103$), abnormal frequency of daily urination (<3 or >15) ($n = 46$), abnormal hours of daily sleep (<4 h) ($n = 22$), females older than 60 years with current menstruation ($n = 22$), and unusually

Abbreviations: OR, odds ratio; CI, confidence interval; SES, socioeconomic status.

* Corresponding author.

E-mail addresses: tepei@mirai-med.or.jp (T. Kiuchi), jzf01334@nifty.ne.jp (K. Asakura), nakano.makiko@z8.keio.jp (M. Nakano), omae.k@keio.jp (K. Omae).

prolonged bidet toilet use (>180 s) ($n = 15$). The final number of subjects analyzed was 7637. To discuss subject characteristics, we compared the proportion of analyzed subjects against Japanese National Survey data (Ministry of Internal Affairs and Communications, 2013).

2.2. Exposure, outcome, and confounding parameters

Bidet toilet use as an exposure parameter was queried in both the baseline and follow-up surveys. The frequency of bidet toilet use was scored as “never used”, “use less than once a week”, “use every day or more than once a week”. For statistical analysis, we defined subjects answering at baseline “never use” or “use less than once a week” as “non-habitual users” and those answering “use every day or more than once a week” as “habitual users.”

Outcome parameters surveyed were physician diagnosis and subjective symptoms of hemorrhoids, irritated perianal skin, cystitis, pyelonephritis, candida vaginitis, bacterial vaginitis, and vulval pruritus. Subjective symptoms of each disease are highly specific, and usually used as important clues to diagnose these diseases. To avoid misunderstanding or confusion of the outcome questions, signs and symptoms of the outcomes were displayed on the same screen as the questions. For example, for candida vaginitis, “If you contract candida vaginitis, your vaginal discharge contains white/yellow-green gloppy or clumpy substance resembling sake paste, cottage cheese, yogurt, or tofu druff, and you suffer from an intensely-itching in the area of the vulva or vagina.” We asked about past history at the baseline survey and about the outcome parameters at the follow-up survey. In the follow-up survey, we requested the subject to answer whether “(1) Newly diagnosed (or experienced symptoms) during the period from the baseline survey to the follow-up survey (February 2013 to February 2014),” “(2) Ever diagnosed (or experienced symptoms) before the baseline survey (before January 2013),” or “(3) Never diagnosed (or experienced symptoms).” If the subject selected the first answer, we counted him/her as an incidence case and if he/she selected the second answer, we counted him/her as a prevalence case.

Other questions asked at baseline included questions about smoking, drinking, fitness, sleeping, showering/bathing, bowel movements, direction of wiping the anus after defecation, menstrual status, sexual activity, academic background, and past/current histories of diseases. Basic characteristics of the subjects such as age, sex, residential area, etc. were already registered in the website research company records, and were provided to us.

2.3. Statistical analysis

Conditions between habitual and non-habitual users were compared using the chi-squared test.

The prevalence and incidence of outcomes were assessed using a crude or adjusted ORs applying a single or a multiple logistic regression model. Before adopting the multiple logistic regression models, a univariate analysis between hemorrhoids and cystitis, pyelonephritis and vaginitis and each possible confounding parameter was conducted. A list of p values applying 2-by-2 or 2-by-3 table analysis between the outcome and the parameters is shown in Supplemental Table 1. Consequently, as explanatory variables in the multiple logistic regression model, we selected such confounding factors as age category (20–39/40–59/60–79 years), marital status, educational background (high/low), smoking habits (current/former/non), alcohol drinking habits (habitual/occasional/non), current history of immune-related diseases (yes/no), and current constipation (yes/no) for analysis of hemorrhoids and related outcomes; and age category, marital status, smoking habit, current menstrual status (yes/no), sexual activity (yes/no) and current constipation (yes/no) for analysis of urogenital outcomes.

Statistical significance was assessed by a two-tailed analysis with $p < 0.05$ considered significant. All statistical analyses were performed

using commercial software (JMP version 10.0.2®; SAS Institute, Cary NC, USA).

3. Results

Among 7637 subjects, 4272 (55.9%) were classified as “habitual users” and 3365 (44.1%) as “non-habitual users.” The proportion of habitual users was larger in males than females. Compared to non-habitual users, habitual users were more likely to be old, married, wealthy, and have a lower constipation rate (female), a higher menopausal rate (female) and higher sexual activity (female). Some confounding parameters showed statistically significant rates, but the differences in the rates between the habitual and non-habitual users were small (Table 1).

Table 2 shows the prevalence and incidence ORs of hemorrhoids diagnosed by a physician, subjective symptoms of hemorrhoids, and subjective symptoms of irritated perianal skin by sex. Both crude and adjusted prevalence ORs of these three disease/symptoms were significantly > 1 in both male and female habitual users. In contrast, the crude and adjusted incidence ORs did not show any significance.

Table 3 shows prevalence and incidence ORs of urogenital outcomes diagnosed by a physician and subjective symptoms of the outcomes in female subjects.

Both a physician diagnosis and subjective symptoms of urological infections, namely, cystitis and pyelonephritis, showed significantly higher crude prevalence ORs in habitual users, but nonsignificant ORs for crude incidence.

Neither prevalence nor incidence ORs of candida vaginitis were statistically significant in habitual users with regard to either physician diagnosis or subjective symptoms.

Both crude and adjusted prevalence ORs of vulval pruritus were significantly higher in habitual users, but significance was lost in the incidence ORs.

The adjusted prevalence OR of bacterial vaginitis symptoms was just failed to reach statistical significance (95% CI = [0.998–2.084]), and the adjusted incidence OR was significant.

The adjusted incidence ORs of other confounding parameters are shown in Supplemental Table 2a, b and c.

4. Discussion

In this prospective 1-year follow-up study of bidet toilet users, we found that hemorrhoids and urogenital infections, excluding bacterial vaginitis, were not causally related to habitual bidet toilet use. Although the incidence of bacterial vaginitis might have been caused by bidet toilet use, incidence rates were small and further studies are needed.

The most significant findings in this study are in its prospective 1-year follow-up of bidet toilet users and incidence calculation. Except for bacterial vaginitis, most point estimates of the crude or adjusted prevalence ORs of all hemorrhoid-related and urogenital outcomes were larger than those of the crude and adjusted incidence ORs. Further, statistical significance in the crude and adjusted prevalence ORs disappeared in the crude and adjusted incidence ORs. These findings strongly suggest that the positive correlations between the urogenital outcomes and habitual bidet toilet use reported earlier (Ogino et al., 2010; Ogino, 2010; Kohdaira, 2009) were not causal relationships, but rather might have been reverse causation. In general, persons with discomfort around the anal or genital areas may prefer to use a bidet toilet.

The incidence ORs of bacterial vaginitis were inversely associated with the prevalence ORs compared to other outcomes, and the adjusted incidence OR of subjective symptoms of bacterial vaginitis was statistically significant. Since the incidence rates of a physician diagnosis and subjective symptoms of bacterial vaginitis in the habitual users were not enough (0.4% and 1.2%) to conclude a causal relationship, these results require additional investigation and long-term follow-up.

Outcome parameters in this study were collected using web questionnaires. The information on subjective symptoms could reveal pre-

Download English Version:

<https://daneshyari.com/en/article/5723650>

Download Persian Version:

<https://daneshyari.com/article/5723650>

[Daneshyari.com](https://daneshyari.com)