Bringing Antibiotics From Overseas And Self-Medication Amongst Australian Chinese Migrants

J Hu, Z Wang

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Abstract

Background: Antibiotics are freely available for purchase without a prescription in some countries. Migrants travelling from and to their home countries may bring along medicines for future use. This study aimed to investigate the practice of bringing antibiotics from outside Australia amongst Chinese migrants and to assess the association between bringing antibiotics and self-medication with antibiotics in this group.

Methods: Chinese migrants who have been residing in Australia longer than three months were recruited through several Chinese social websites to complete an online bilingual health survey. Multiple logistic regressions were performed to assess the associations between bringing antibiotics into Australia and self-medication with antibiotics.

Results: Out of 469 Chinese migrants, 148 (32%) admitted that they had brought antibiotics into Australia during their latest trip to China or other countries. The practice of bringing antibiotics into Australia was not associated with most of the demographic and socioeconomic characteristics except education level and the main language spoken at home. Over sixty percent of who brought antibiotics believed they could treat the disease with previous experience. More than half of them perceived it may be expensive to consult a doctor in Australia. Furthermore, the practice of bringing in antibiotics from overseas was significantly associated with self-medication of antibiotics among Australian Chinese migrants (adjusted OR: 4.5, 95% CI: 2.6-7.8).

Conclusions: Although antibiotic sales are well regulated in Australia, many Chinese migrants bring in antibiotics from outside Australia which increases the risk of self-medication. Our findings support that antibiotics crossing the border should be better regulated in Australia.

BACKGROUND

Antibiotic resistance is an international public health problem. The antimicrobial resistant bacteria cannot be contained within individuals. In contrast they are highly spreadable and difficult to confront (World Health Organization, 2001). With the rising demands of traveling and immigration, infectious diseases are becoming harder to constrain. Reducing antibiotic resistance is challenging and requires global efforts. WHO has led actions on global surveillance on antibiotic resistance and antibiotic use (World Health Organization, 2014). The usage of antibiotics is associated with the occurrence of antibiotic resistance (Shaban, Cruickshank, Christiansen, & & the Antimicrobial Resistance Standing Committee, 2013). Nevertheless the knowledge, attitude and use of antibiotics by consumers could interfere with the decisions of prescription, and may arouse further consequences in developing antibiotic resistance (Consumers Health Forum of Australia, 2011).

Self-medication with antibiotics is one of the important contributors of antibiotic resistance worldwide (Cars & Nordberg, 2005; World Health Organization, 2001). Antibiotics are freely available for purchase in some countries. The risk of self-medication with antibiotics may be significantly enhanced when antibiotics are available without instant medical consultation (McNulty, Boyle, Nichols, Clappison, & Davey, 2006; Togoobaatar, Ikeda, Ali, Sonomjamts, Dashdemberel, Mori, & Shibuya, 2010).

In Australia, there has been a significant increase in the prevalence of antimicrobial resistance over the last decade (Parliament of Australia, 2013). While efforts have been cast on antibiotic resistance surveillance and regulatory controls

of antibiotic use in hospitals, antibiotic use in the community could also play an important role in developing antibiotic resistance (Parliament of Australia, 2013). The rate of self-medication with antibiotics for cold and flu was recorded at around 10.8% in 1999 and with a notable decrease in 2004 (7.4%) after a national promotion campaign for rational use of antibiotics (Wutzke, Artist, Kehoe, Fletcher, Mackson, & Weekes, 2007). The effectiveness of education programs on rational use of antibiotics to the general public of Australia had been demonstrated, but ongoing efforts are required (Parliament of Australia, 2013). However, the rate of self-medication for other diseases was not documented, neither was the antibiotic use in migrants and ethnic minority groups.

Migrants, in particular those were born in countries where antibiotics were not well regulated, were likely to continue the practice of self-medication of antibiotics in hosting countries. In New Zealand, Norris et al. reported a high percentage of non-prescribed antibiotic use among Korean and Egyptian migrants (Norris, Ng, Kershaw, Hanna, Wong, Talekar, Oh, Azer, & Cheong, 2010) and gaps in knowledge regarding the use of antibiotics among Samoan people (Norris, Churchward, Fa'alau, & Va'ai, 2009). Migrants that are travelling from and to their home countries may bring along medicines for future use. How migrants store and use the antibiotics bought from outside Australia is a matter of concern. This study aimed to investigate the practice of bringing antibiotics from outside Australia amongst Chinese migrants and to assess its association with self-medication of antibiotics. The findings will help to identify the high risk group and to develop targeted interventions in order to reduce inappropriate antibiotic use among Australian Chinese migrants.

METHODS

Participants and procedure

An online health survey involving a structured questionnaire was conducted on several Chinese social websites during July 2013 and October 2013. The details of the study procedure have been described elsewhere (Hu & Wang, 2014). In total, 469 Chinese migrants who have been living in Australia longer than three months completed the survey. The study was approved by University of Queensland School of Medicine Low Risk Ethical Review Committee (2013-SOMILRE-0074).

Measures

The self-administrated questionnaire was available in both English and Chinese (Simplified and Traditional). The following variables were measured for this study. Demographics: Age, gender, education, birthplace, state of residence, occupation, marital status, parental status, household annual income, English proficiency, main language spoken at home, Medicare entitlement, private insurance coverage. Antibiotic use: Participants were asked if they used antibiotics in the last 12 months. With those who used antibiotics, they were requested to clarify the source of their antibiotics. Responses as “Available at home” or “My friends gave it to me” or “Bought online” were coded 1 for self-medicating with antibiotics, response as “prescribed by a doctor” was coded 0 for not self-medicating with antibiotics. Practice of importing antibiotics: Participants were asked if they had brought antibiotics in Australia during their last oversea trip. For those who admitted to bring antibiotics into Australia, we asked them to choose from a list of statements which may explain the reasons of such practice. We also asked whether they thought antibiotics should be sold without prescriptions in Australia.

Statistical analysis

Descriptive analyses were performed to understand the Characteristics of the sample. Chi-square tests were performed to assess the associations of demographic/socioeconomic factors and the practice of bringing antibiotics into Australia. Multiple logistic regressions were performed to assess the associations between bringing antibiotics in Australia and self-medication with antibiotics. We considered the association is statistically significant if $P<0.05$. All data analyses were performed using Stata version 13 (StataCorp., 2013).

RESULTS

Out of the 469 Chinese migrants, 148 (32%) admitted that they had brought antibiotics into Australia during their trip to China or other countries. Participants were residents of five different states of Australia when they were undertaking the survey. Fifty-five percent of them were females. The mean age was 33 (8.2) years and the mean length of residing in Australia was 6 (SD: 4.2) years. The demographic characteristics of the two groups with or without bringing antibiotics from outside Australia were compared in Table 1. Most of the demographic and socioeconomic characteristics were not statistically different among these two groups. However, there were more people with a degree in the group

that admitted having brought antibiotics than in the other group. And only 4% of those who admitted having brought antibiotics into Australia mainly spoke English at home, which was significantly lower than the other group (11%).

We compared the prevalence of self-medication of antibiotics among the two groups with or without bringing antibiotics from overseas; the results are illustrated in Figure 1. As delineated in Figure 1a, the prevalence of self-medication with antibiotics in the male group is 41% (95% CI: 30%-53%) among those who brought antibiotics from overseas and 14% (95% CI: 8%-20%) among those who did not bring antibiotics from overseas. Similarly in the female group, the prevalence is 41% (95% CI: 30%-53%) versus 9% (95% CI: 5%-14%) among migrants who brought or did not bring antibiotics from overseas. We also did a sensitivity analysis of a subgroup of 189 participants who claimed to have used antibiotics in the last 12 months and the result is consistent that the prevalence of self-medication with antibiotics was much higher in participants with the practice of bringing antibiotics from overseas (Figure 1b).

Although education level and the main language spoken at home were associated with the act of bringing antibiotics from outside Australia, we found a similar pattern of self-medication with antibiotics stratified by education and language (Figure 2). In Table 2, the associations between bringing antibiotics and self-medication with antibiotics were statistically significant after controlling for all the potential factors (OR: 4.5, 95% CI: 2.6-7.8). The adjusted odds ratio of self-medication for bringing antibiotics from overseas was higher in female group (OR: 5.9, 95% CI: 2.6-13.2) than in male group (OR: 3.2, 95% CI: 1.4-7.2).

Many (40.6%) believed that antibiotics should be available for purchase over the counter in Australia. In Table 3, we explored the possible reasons for bringing antibiotics or other medicines into Australia. Over 60% of participants who had brought antibiotics said they can treat the disease with their previous experience. Around half of them thought "It is too expensive to see a doctor in Australia".

DISCUSSION

In this online survey, almost 32% participants admitted having brought antibiotics into Australia during the last trip to China or other countries. The practice of bringing antibiotics from overseas is a significant risk factor for self-medication with antibiotics among Australian Chinese migrants. Apart from education level and the main language spoken at home, the practice of importing antibiotics into Australia was not associated with most of the demographic and socioeconomic characteristics.

We found participants who claimed to have brought antibiotics from outside Australia were four and a half times more likely to self-medicate with antibiotics if we controlled for education level, main language spoken at home and eight other demographic/socioeconomic factors. Many studies confirmed the availability of antibiotics without medical consultation was related to an increased possibility of self-medication (Grigoryan, Burgerhof, Degener, Deschepper, Lundborg, Monnet, Scicluna, Birkin, & Haaijer-Ruskamp, 2008; McNulty et al., 2006; Togoobaatar et al., 2010). It is important to recognize that migrants may have various means of accessing antibiotics.

A study found that many Latino Americans transported non-prescribed antibiotics into the United States as well as obtained antibiotics in the United States without a prescription (Mainous, Cheng, Garr, Tilley, Everett, & McKee, 2005). Antibiotics were also noted to be freely available for purchase online without a prescription (Mainous, Everett, Post, Diaz, & Hueston, 2009). Also a large number of migrants (30% of Egyptians & 57% of Koreans) in New Zealand claimed to have obtained antibiotics illegally prescribed by nurses or pharmacies without prescription (Norris et al., 2010). The sources of non-prescribed antibiotics included friends, family, medicine stored at home (Norris et al., 2010).

The practice of bringing antibiotics into Australia is common among Chinese migrants regardless of age, gender, occupation, income, marital status, the time they have resided in Australia and their English proficiency. In particular, Chinese migrants who have an undergraduate or higher degree were more likely to bring antibiotics from overseas. A similar result was reported in Latino Americans but the association was not statistically significant (P=0.09) (Mainous et al., 2005). The findings of the households survey of antimicrobial drugs in UK showed people with a higher education or were more knowledgeable about antimicrobial drugs are more likely to keep antibiotics at home (McNulty et al., 2006).

As some studies showed people with a higher education level are not necessarily more prudent about antibiotic use, some studies conversely revealed a higher risk to self-medicate with antibiotics among highly educated people (Al-Azzam, Al-Husein, Alzoubi, Masadeh, & Al-Horani, 2007; Zafar, Syed, Waqar, Zubairi, Vaqar, Shaikh, Yousaf, Shahid,

& Saleem, 2008). Migrants are generally well-educated due to the immigration regulations (Australian Bureau of Statistics, 2008); however, we should not assume they are conversant about antibiotics and antibiotic use. Our findings suggest culturally sensitive interventions to reduce the practice of bringing antibiotics into Australia among Chinese migrants may largely decrease non-prescribed antibiotic use.

Previous studies demonstrate that the use of non-prescribed antibiotics was prevalent in many countries, in particular where antibiotics are freely available for purchase over the counter (Hassali, Shafie, Al-Qazaz, Tambyappa, Palaian, & Hariraj, 2011; Mitsi, Jelastopulu, Basiaris, Skoutelis, & Gogos, 2005; Morgan, Okeke, Laxminarayan, Perencevich, & Weisenberg, 2011; Nakajima, Takano, Urnaa, Khaliun, & Nakamura, 2010; World Health Organization, 2001). Although antibiotics are legally unavailable without a prescription in Australia, four out of ten Chinese migrants thought it should be freely available for purchase over the counter. In our study, we explored the possible reasons for the practice of transporting antibiotics into Australia. The most favourable reason was the previous experience of treating the disease. The perceived high cost of medical services in Australia was another common explanation. Almost half of those who brought antibiotics into Australia said their parents or friends suggested them to do so. More than thirty percent of them agreed that antibiotics are effective for upper respiratory tract infections.

As we can see, there are gaps in knowledge and perceptions of antibiotic use and the Australian health services which may have boosted the importation of antibiotics into Australia. Antibiotics crossing the border should be declared with a valid prescription. Migrants from a country where antibiotic sales are not well regulated may not fully understand the regulations of antibiotic sale in Australia. Education messages regarding the Australian health services and the necessity of obtaining antibiotics with medical prescriptions should be delivered to migrants upon their arrival to Australia.

Limitations

The major limitation of the study is the adoption of a non-random sampling method, which compromised the representativeness of our sample to the whole Australian Chinese community. We employed a web-based approach to recruit; as a result, older Chinese migrants who do not use the Internet were likely to be missed. However, the sample obtained from online recruitment consisted of Chinese migrants living in five different states in Australia. The practice of bringing antibiotics was not different by the geographical location of Chinese migrants in Australia. In addition, this study required participants to provide some information about the behaviours in the past. The results are based on responders' recall which may have caused information bias.

CONCLUSIONS

In conclusion, we found a considerable number of Chinese migrants bring antibiotics into Australia and such practice is significantly associated with an elevated risk of self-medication with antibiotics in the community. Health interventions should target this risk behavior to help tackle the growing threat of antibiotic resistance.

Figure 1

Prevalence (95% CI) of self-medication with antibiotics among Chinese migrants with bringing or without bringing antibiotics from outside Australia (by gender)

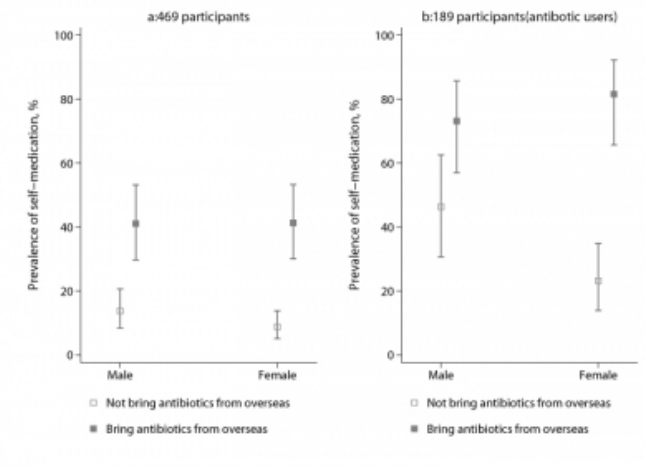

Figure 2

Prevalence (95% CI) of self-medication with antibiotics among Chinese migrants with bringing or without bringing antibiotics from outside Australia (by education level & by main home spoken language)

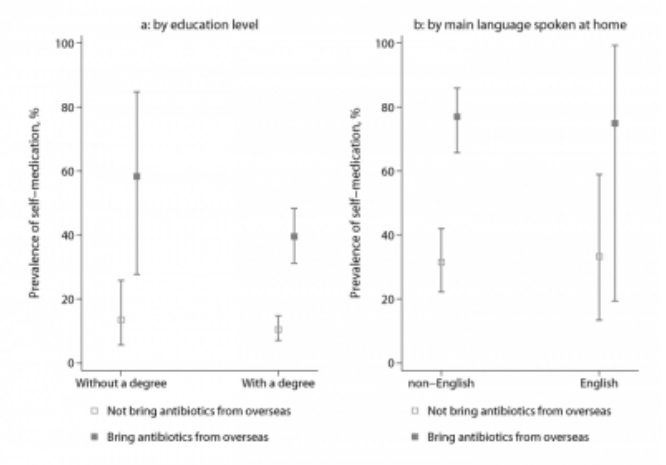

Table 1

Comparison of characteristics between the two groups with or without bringing antibiotics from outside Australia, n (%)

Variables	Bringing in antibiotics	Without bringing in antibiotics	*P* value
Total participants	148 (32)	321 (68)	
Age, years			0.6
<30	46 (32)	110 (35)	
30-39	66 (45)	146 (46)	
>=40	33 (23)	59 (19)	
Gender			
Female	75 (51)	183 (57)	0.2
Residing state			0.3
New South Wales	28 (19)	69 (22)	
Queensland	67 (47)	146 (47)	
South Australia	9 (6)	7 (2)	
Victoria	31 (22)	69 (22)	
West Australia	9 (6)	22 (7)	
Education			0.02
Undergraduate or higher degree	134 (92)	268 (84)	
Household annual Income, AUD			0.2
>=50, 000	81 (60)	197 (67)	
Occupation			0.99
Professional	63 (43)	142 (44)	
Non-professional	34 (23)	72 (23)	
Home duties/unemployed	20 (13)	41 (13)	
Students	31 (21)	65 (20)	
Marriage status			0.3
Married/De facto	115 (78)	235 (74)	
Parent			0.9
At least one child	67 (48)	144 (48)	
Length of residing in Australia, years			0.7
>=5	79 (54)	178 (56)	
Self-reported English proficiency			0.5
Above average	67 (46)	160 (50)	
Average	64 (43)	136 (42)	
Poor	16 (11)	25 (8)	
Main language speaks at home			
English	6 (4)	35 (11)	0.02
Being entitled to Medicare	125 (86)	283 (88)	0.4

Table 2

Bringing antibiotics from overseas and the associations with self-medication with antibiotics

	Self-medication		Without self-medication		Adjusted[a] OR (95% CI)
	Bring	Not bring	Bring	Not bring	
Females	31	16	44	167	5.9 (2.6-13.2)
Males	30	19	43	119	3.2 (1.4-7.2)
Total	61	35	87	286	4.5 (2.6-7.8)[b]

OR, Odds Ratio; CI, Confidence Interval

[a] Adjusted for age, education level, household annual income, marital status, occupation, length of stay in AU, main language spoken at home, oral English proficiency, entitlement to Medicare.

[b] Adjusted for the above factors plus gender

Table 3

Possible reasons for bringing Antibiotics from outside Australia (n=148)

Statement	n (%)
It's too expensive to see a doctor in Australia.	75 (51)
Antibiotic is effective for upper respiratory tract infections.	46 (31)
I can treat the disease with my previous experience.	92 (62)
I don't have time to see a doctor for minor problems.	29 (20)
My parents or friends suggest me to do so.	65 (44)

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Author Information

Jie Hu
Centre for Chronic Disease, School of Medicine, University of Queensland
Herston, Queensland, Australia
Phone: +61 7 33464831; Fax: +61 7 3346 5178 E-mail: j.hu1@uq.edu.au; z.wang@uq.edu.au

Zhiqiang Wang
Centre for Chronic Disease, School of Medicine, University of Queensland
Herston, Queensland, Australia