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J Health Care Poor Underserved. 2013 November ; 24(4): 1511–1521. doi:10.1353/hpu.2013.0172.**Hypertension among Oral Contraceptive Users in El Paso, Texas****Kari White, PhD, MPH, Joseph E. Potter, PhD, Kristine Hopkins, PhD, Jon Amastae, PhD, and Daniel Grossman, MD**

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Abstract

On the U.S.-Mexico border, residents frequently cross into Mexico to obtain medications or medical care. We previously reported relatively high prevalence of hypertension among Latina oral contraceptive users in El Paso, particularly those obtaining pills over the counter (OTC) in Mexico. Here, we examine factors associated with having hypertension among 411 OTC users and 399 clinic users. We also assess hypertension awareness and interest in using blood pressure kiosks. Women age 35 to 44 and who had BMI ≥ 30 kg/m² had higher odds of having hypertension. 59% of hypertensive women had unrecognized hypertension, and 77% of all participants would use a blood pressure kiosk; there were no significant differences between clinic and OTC users. Alternative approaches to increase access to health screenings are needed in this setting, where OTC pill use among women with unrecognized hypertension confers unique health risks.

Keywords

Hypertension; oral contraceptives; screening; U.S.-Mexico border; Hispanic/Latina

Many studies have documented that Latinos living in cities and states along the U.S.-Mexico border frequently cross into Mexico to purchase medications or obtain health and medical services.¹⁻⁵ In a representative sample of California residents, Wallace *et al.* found that 11% of Mexican-origin adults in the state obtained medical or dental services or medications in Mexico in the previous year.⁵ Several other studies conducted in U.S. cities and counties located just across the border from Mexico found that between 20% and 50% of sampled participants reported cross-border use of health services or purchase of medications in the last year.^{1-4,6,7}

A common finding in these studies is that individuals who lack health insurance are more likely to cross into Mexico for services, where the cost of care is typically lower than that in US health care settings.^{2,4-7} These results indicate that health services in Mexico represent an important safety net for low-income and under- or uninsured border residents. However, some authors argue that these U.S. residents still lack access to a full range of services as

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they primarily use health care in Mexico for specific health needs (e.g., minor emergencies and dental care).⁴ As a result, they may not be receiving important preventive and primary health care services.

In a recent prospective cohort study of El Paso resident women using oral contraceptive pills, we found that those who obtained their method over the counter (OTC) at Mexican pharmacies were less likely to have health insurance than women who obtained pills at U.S. clinics and health centers.⁸ Over-the-counter pill users in this sample had clear reasons for preferring the cross-border option, the most common of which was the perceived lower cost of pills in Mexico. Although OTC users were less likely than U.S. clinic users to report a regular source of health care, the vast majority had received important reproductive health screenings such as Pap smears and testing for sexually transmitted infections.⁹

However, we also found that OTC users in this sample were more likely than US clinic users to have medical conditions considered contraindications to use of combined oral contraceptive pills (COCs).¹⁰ Hypertension, which increases risk of myocardial infarction and stroke among women using COCs,¹¹⁻¹³ was the most common contraindication identified. Although we observed a higher prevalence among OTC users compared to clinic users, hypertension was higher in both groups than other samples of reproductive aged women using oral contraceptives.¹⁴ This finding suggests that there is likely a large amount of unrecognized hypertension in this population.

In this article, we conduct a more detailed analysis of hypertension in this sample of combined oral contraceptive users. Specifically we assess the factors associated with having hypertension as well as women's awareness of the condition. Since obtaining pills OTC in Mexico may be an indicator of women's lack of access to regular care (where they would receive blood pressure screening) we also report on women's interest in using kiosks outside of clinics to measure their blood pressure.

Methods

Setting

El Paso, Texas, like many other cities near or along the U.S.-Mexico border, is characterized by low incomes and a substantial proportion of the population lacking health insurance. According to the 2005–2009 American Community Survey, El Paso's median household income of \$36,147 makes it the sixth poorest among U.S. counties with populations greater than 250,000.¹⁵ An estimated 29% of El Paso's residents live in poverty.¹⁵ Approximately 35% of El Paso adults age 18 and older lack health insurance,¹⁶ and the percentage of adult Latinos without insurance is even higher.¹⁷

Low-income and under- or uninsured reproductive aged women in El Paso can access reproductive health services through U.S. health clinics and centers where state-administered federally-funded programs enable them to receive contraception and important health screenings for little or no cost. Previous research in El Paso also found that a large percentage of women cross the border for contraception. Among multiparous women delivering in a large El Paso hospital, 50% cited Mexican pharmacies as their contraceptive

source prior to pregnancy.¹ Oral contraceptive pills were one of the most commonly reported methods obtained from pharmacies across the border, where the cost is around \$5 per cycle.

Data

The data for this analysis come from the Border Contraceptive Access Study, a prospective cohort study of El Paso resident women between ages 18 and 44 years who were oral contraceptive users.¹⁸ Women in this study obtained pills from U.S. clinics (n=532) or OTC at Mexican pharmacies (n=514).⁸ Bilingual (English/Spanish) female interviewers recruited a portion of the clinic user sample from the main family planning providers in El Paso. The remaining clinic sample and entire OTC user sample were recruited using announcements and presentations at local community centers, flyers and referrals from other participants. Study participants completed a series of four interviews at three-month intervals: a baseline face-to-face interview (conducted between December 2006 and February 2008), telephone interviews at three and six months after the baseline, and a nine-month face-to-face follow-up interview. Overall, 941 women (90% of the baseline sample) completed the nine-month follow-up interview by the end of data collection in December 2008.

In the baseline interview, participants provided information about basic sociodemographic characteristics, their health insurance status, regular source of care, and current oral contraceptive use, including pill brand. Interviewers also asked women if they had high blood pressure or were taking medication for high blood pressure and the date of their last blood pressure measurement. During each follow-up interview, participants were asked to report their health insurance status, current contraceptive method, if they had had their blood pressure measured since their last interview, and if they were taking medications for hypertension.

Having found a high prevalence of hypertension among a sample of reproductive aged women in the general population in El Paso,¹⁹ we collected more detailed information about hypertension and associated risk factors in the nine-month interview. Specifically, interviewers asked women whether they had ever been told by a doctor, nurse, or other health professional that they had hypertension, where they last had their blood pressure measured, and whether they thought hypertension was very serious, somewhat serious, or not a serious problem. Participants were also asked to report if they had ever smoked or currently smoked cigarettes, if they had engaged in any moderate exercise in the last 30 days and, if so, the number of times per week. Moderate exercise was assessed as any physical activity that lasted at least 10 minutes and caused sweating or an increase in heart rate or breathing. Additionally, interviewers showed participants a picture of a blood pressure kiosk and asked if they would be interested in having their blood pressure checked at a similar kiosk. Those interested in using a kiosk were asked if they would consider paying a small fee to have their blood pressure measured and, if so, how much they would pay. Those not interested in using the kiosk were asked why they were not interested.

At the end of the nine-month follow-up interview, interviewers also measured participants' height, weight, and blood pressure. Participants' height was measured using a Seca Road Rod 214 stadiometer, and their weight was measured using a Seca Clara 803 digital scale

(Seca Corporation). Using these height and weight measurements, we calculated women's body mass index (BMI, calculated as weight (kg)/[height (m)]²). For women missing height and/or weight measurements at the final interview (n=181), we calculated BMI using their self-reported height and weight at the baseline interview. A small number of participants (n=38) were missing both self-reported height and weight, as well as the nine-month interview measurements. We categorized participants into three groups: normal weight (< 25.0 kg/m²), overweight (25.0–29.9 kg/m²), and obese (≥ 30.0 kg/m²).

Interviewers were trained to measure participants' blood pressure using an automated Omron HEM 705CP blood pressure monitor (Omron Healthcare, Bannockburn, IL). They took two blood pressure measurements five minutes apart and recorded the mean systolic and diastolic blood pressure. We classified women as having hypertension if their average systolic blood pressure was ≥ 140 mm Hg, their average diastolic blood pressure was ≥ 90 mm Hg, or if their average blood pressure was <140/90 mm Hg and they were taking medication for high blood pressure.¹³ If a woman with blood pressure ≥ 140/90 mm Hg reported having ever been told by a doctor, nurse, or other health professional that she had hypertension, we considered her aware of her condition.

Participants provided written informed consent before completing the baseline interview and received gift cards valued between \$10 and \$35 for each interview they completed. Women who had a high blood pressure measurement at the nine-month follow-up interview, or other self-reported contraindications to pill use at any interview, were given a referral to a health care provider. This study was approved by the institutional review boards at the appropriate institutions.

For the current study, we restricted the original sample of 1,046 women to those who completed the nine-month interview, who were not pregnant at the time of the interview and had a valid blood pressure measurement (n=836). Since hypertension is only considered a contraindication to COCs, we excluded women who reported using progestin-only pills (n=12) or did not report a pill brand (n=8) at baseline. Women missing information on sociodemographic characteristics or BMI (n=6) were also excluded. Our final analytic sample included 399 clinic users and 411 OTC users, 89% of whom were still using COCs at the nine-month interview.

Statistical analysis

We compared women's sociodemographic characteristics and the proportion having hypertension and the proportion who were told they had hypertension separately for clinic and OTC pill users. The statistical significance of differences in proportions was determined using chi-squared tests. Using logistic regression, we estimated crude and multivariable adjusted odds ratios for having hypertension based on the average blood pressure reading at the nine-month follow-up interview. In addition to source of COCs at baseline, our multivariable model included women's age, BMI, smoking status, and whether she had a source of regular care as these factors have been associated with hypertension in this population and other samples with Latina women.^{19–21} We also assessed the proportion of women interested in using a kiosk for blood pressure measurements according to their

sociodemographic characteristics. All analyses were conducted using Stata 11.0 (StataCorp LP, College Station, TX).

Results

Compared with clinic users, OTC users were older and more likely to have had children, to have less than a high school level education, and to have been born in Mexico (Table 1). With respect to indicators of access to care, OTC users were less likely than clinic users to have U.S. health insurance and to report having a regular source of care. Approximately one-third of women did not engage in moderate exercise in the last 30 days and just over two-thirds were overweight or obese; there were no significant differences between clinic and OTC users. Although relatively few women were current smokers, a slightly higher percentage of OTC users than clinic users reported that they smoked.

Additionally, OTC users were less likely than clinic users to have had their blood pressure checked in the last two years. Among those who had a recent blood pressure measurement, 83.0% of clinic users and 50.3% of OTC users did so at a clinic or doctor's office in the U.S.; 15.5% of OTC users reported their last blood pressure measurement was at a clinic or doctor's office in Mexico (results not shown). Health fairs, work sites, community centers, and pharmacy kiosks were also mentioned as other places where women last had their blood pressure measured.

Overall, 7.0% of clinic users and 10.5% of OTC users had hypertension (Crude OR: 1.55, 95% confidence interval 0.94–2.55, $p=.085$). After multivariable adjustment, the odds ratio for OTC users was 1.38 (95% confidence interval 0.82–2.35) (Table 2). Compared with women ages 18 to 34, women who were 35 years or older were more likely to have hypertension. In addition, women with a BMI ≥ 30.0 kg/m² had significantly higher odds of hypertension than those with BMI < 25.0 kg/m² (OR: 6.05, 95% confidence interval 2.50–14.6). Women's smoking status and having a regular source of care were not significantly associated with having hypertension.

Among women with hypertension, 59.1% said they had never been told they had high blood pressure (results not shown). There were no significant differences in awareness between clinic and OTC users. We also did not identify any significant associations between hypertension awareness and age, health insurance, BMI or perceived seriousness of hypertension. Although a higher percentage of women who had a usual source of care were considered aware that they had hypertension, just over half (55.3%) reported having ever been told they had high blood pressure.

When asked if they would be interested in using a kiosk to have their blood pressure measured, 76.9% of women responded that they would. We did not identify any significant associations in demographic characteristics or indicators of health care access and interest in using a kiosk. Of those interested in using a kiosk, 86.2% said they would be willing to pay a small fee (e.g., $< \$5.00$) to have their blood pressure checked. Of those not interested in the kiosk ($n=187$), the most commonly reported reasons were that they would prefer to see a doctor or go to the clinic (34.2%), would not trust the measurement (30.5%), and did not

think the kiosk was private (10.2%). Other reasons women mentioned for not being interested included that they would not understand the blood pressure reading, did not think they were at risk for high blood pressure, or checked their blood pressure at home or work.

Discussion

Compared with other studies of reproductive aged women using oral contraceptives,¹⁴ we found a higher prevalence of hypertension in this sample of women using COCs. This was true for both women who obtained pills at U.S. clinics and those who obtained their method OTC in Mexico, although the prevalence of hypertension was somewhat higher among OTC users. This may be due, in part, to the older age of women in our sample; however, the hypertension prevalence we observed was also higher than that reported for women ages 35 to 44 using oral contraceptives in the Behavioral Risk Factor Surveillance System.²² The large proportion of participants who were overweight and obese also contributes to our findings, as higher BMI is a significant risk factor for having hypertension.^{20,23}

Additionally, we found high levels of unrecognized hypertension among those women who had high blood pressure, but awareness of having hypertension was not significantly different for clinic and OTC users. It may be that when women get their blood pressure measured, they receive limited information about the potential risks associated with using COCs if they have hypertension. Almost one-fifth of clinic users and one-third of OTC users who had their blood pressure checked in the last two years did so outside a clinical setting, and therefore may not have been asked about their current contraceptive use. Although women in this sample did recognize hypertension as a serious health problem in general, they likely do not believe they are at risk at younger ages and may not have adequate information about other important risk factors.²⁴ Given that other studies have also found hypertension awareness is low among younger and Mexican-origin women,^{21,23,25} additional community-based educational efforts are needed to increase awareness about hypertension among reproductive aged women in this population.

It is also a matter for concern that 41% of these women were using oral contraceptives despite having been told they had hypertension. This may be because they were unaware that hypertension is a contraindication to COC use, or because they had no other options for effective contraception and chose the risks of pill use over pregnancy. We are exploring this issue in more detail in a related qualitative study of COC users with hypertension in El Paso.

These results highlight the need to improve access to important health screenings in settings such as the US-Mexico border. Some women in our sample had not had a blood pressure measurement in the last two years, and lack of recent screening was more common among OTC users, who are less likely to have regular access to care overall. Although federally qualified health centers and safety-net providers in these areas may expand access to care for low-income and uninsured populations, these organizations currently do not have the capacity to meet the large existing demand for care.^{26–28} While national health care reform may also increase access to screening for groups that currently lack health insurance and regular sources of care, a significant portion of the border population may not benefit from the reforms due to their immigration status. Therefore, alternative approaches to increase

screening for conditions such as hypertension must be considered. Community health promoters, or *promotores*, may be particularly effective at educating this border population about and screening for hypertension.^{29,30}

Kiosks in pharmacies or other stores may also be worth considering. Several women in our sample reported using pharmacy kiosks for blood pressure measurements, and approximately 75% of women stated that they would be interested in using a kiosk and would be willing to pay a small fee to have their blood pressure measured. Using a kiosk, combined with a validated checklist of contraindications to oral contraceptives,¹⁹ may help women who obtain their pills OTC in Mexico self-screen for safe oral contraceptive use, particularly since previous research has found that pharmacists frequently do not discuss contraindications with women obtaining oral contraceptive pills.³¹ The presence of kiosks in pharmacies and other convenient settings on the U.S. side of the border may also help increase routine screening among women who are unable to cross back and forth between Mexico, due to their immigration status or fear of the increasing violence in Mexico. Although it is important that women who self-identify contraindications are able to obtain an additional evaluation prior to initiating use, it is worth noting that—for contraindicated women—the health risks associated with hypertension would be exacerbated by an unintended pregnancy.³²

The findings from this study should be interpreted in the context of its limitations. Since we only measured women's blood pressure on a single day, we may have overestimated the prevalence of hypertension in this sample. It is possible that some participants experienced *white coat* hypertension (elevated blood pressure in clinical or other similar settings), and that the true proportion of women with high blood pressure in this sample is lower than what we report here. Additionally, we have limited information about factors associated with hypertension awareness and why women who know they have hypertension continue to use COCs. As noted above, we are exploring these issues in a related study. Finally, our results may not be generalizable to other areas along the U.S.-Mexico border where better access to safety-net providers may improve detection and treatment of hypertension among low-income and uninsured populations. However, given the large number of border communities that have primary health professional shortages,²⁸ it is likely that residents in many of these areas may be at risk of developing high blood pressure or are unaware that they have hypertension.

Conclusion

In the cities and towns along the U.S.-Mexico border where there is a large population of low-income and under- and uninsured U.S. residents and limited primary health care resources, access to health services in Mexico, including contraception, represents an important component of the health care safety net. However, this patchwork of care may result in residents having limited information about risk factors for common morbidities such as hypertension and lack of consistent, comprehensive care that would permit the diagnosis, treatment, and management of these conditions. Over-the-counter use of combined oral contraceptives in the context of unrecognized hypertension may put this population at particular risk. The uncertain potential of health care reform to extend

coverage to many border residents points to a pressing need to develop alternative approaches to improve education and health care access for this population.

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Notes

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Table 1

CHARACTERISTICS OF PARTICIPANTS BY SOURCE OF COMBINED ORAL CONTRACEPTION AT BASELINE

	US Clinic (n=399) %	OTC in Mexico (n=411) %	χ^2 p-value
Age			
18–24 years	33.6	19.2	<.001
25–34 years	41.6	41.1	
35–44 years	24.8	39.7	
Parity			
0 live births	17.8	10.0	.001
1 or more live births	82.2	90.0	
Education			
Less than High School	46.6	52.8	.079
High School or more	53.4	47.2	
Nativity/Education			
Born and Educated in US	35.6	19.0	<.001
Born in Mexico, Educated in US	33.1	36.0	
Born and Educated in Mexico	31.3	45.0	
US insurance coverage			
No US health insurance	71.4	84.9	<.001
Has US health insurance	28.6	15.1	
Regular source of care			
No regular source of care	46.9	66.4	<.001
Has a regular source of care	53.1	33.6	
Engaged in moderate exercise ^a			
No moderate exercise	31.8	30.7	.171
Moderate exercise 1–3 times/week	38.1	33.3	
Moderate exercise 4 times/week	30.1	36.0	
Body Mass Index			
Normal weight (< 25.0 kg/m ²)	27.8	27.5	0.298
Overweight (25.0–29.9 kg/m ²)	35.3	40.1	
Obese (≥ 30.0 kg/m ²)	36.8	32.4	
Smoking			
Non-smoker	69.4	71.3	.058
Former smoker	18.3	12.9	
Current smoker	12.3	15.8	
Last blood pressure measurement			
Within last 2 years	99.0	91.2	<.001
More than 2 years	1.0	8.8	

^a Moderate exercise was defined as having engaged in any physical activity for at least 10 minutes that caused sweating or an increase in heart rate or breathing. Women who were unable to engage in moderate exercise (n=1) were included with women who did not report any moderate exercise.

Table 2

FREQUENCIES AND MULTIVARIABLE ADJUSTED ODDS RATIOS (95% CI) FOR HYPERTENSION^a
AT THE 9-MONTH FOLLOW-UP INTERVIEW

	%	AOR (95% CI)
Source of COCs at baseline		
US Clinic	7.0	1.00 (ref)
OTC in Mexico	10.5	1.38 (0.82–2.35)
Age		
18–34 years	4.9	1.00 (ref)
35–44 years	16.8	3.47 (2.06–5.87) *
Body Mass Index		
Normal weight (< 25.0 kg/m ²)	2.7	1.00 (ref)
Overweight (25.0–29.9 kg/m ²)	6.5	1.97 (0.77–5.06)
Obese (≥ 30.0 kg/m ²)	16.1	6.05 (2.50–14.6) *
Smoking		
Non-smoker	8.2	1.00 (ref)
Former smoker	8.7	1.03 (0.50–2.12)
Current smoker	11.4	1.52 (0.76–3.04)
Regular source of care		
No regular source of care	6.1	1.00 (ref)
Has a regular source of care	10.1	1.48 (0.81–2.68)

*
p < .05

^aWomen were classified as having hypertension if they had an average systolic blood pressure measurement ≥ 140 mm Hg or average diastolic blood pressure measurement of ≥ 90 mm Hg or if they had blood pressure < 140/90 and reported taking medication for hypertension.

AOR = Adjusted Odds Ratio

CI = Confidence Interval