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Prevalence and Risk Factors of Hypertension in Myanmar: A Systematic Review and Meta-Analysis

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Abstract: Hypertension (HPT) is the most common condition seen in primary care that can lead to health consequences and death if not detected early and treated appropriately.

This study aimed to synthesize the prevalence, awareness, and control of HPT, and investigate the risk factors for HPT in Myanmar.

We performed a meta-analysis of observational studies. Relevant studies were searched in electronic databases. The methodological quality of the included studies was assessed in 3 domains: selection bias, measurement bias, and bias related to data analysis. The overall prevalence and proportions was calculated using random-effect model of DerSimonian–Laird method. To identify the risk factors for HPT in Myanmar, we entered the ratio measures of the (adjusted) effect as a log odds ratio (OR) and the standard error of the log OR using generic inverse-variance weighting method. For stability of results, we performed leave-one-study-out sensitivity analysis by omitting individual studies one at a time from the meta-analysis.

Seven studies (n = 20,901) were included in this analysis. Overall prevalence of HPT in Myanmar was 22% (95% confidence interval (CI): 14%–31.7%, I^2: 99.6%), stratified as 21.5% (95% CI: 14.1%–29.9%, I^2: 98.7%) in men and 22.7% (95% CI: 10.8%–34.6%, I^2: 99.5%) in women. Overall, prevalence of HPT increased with an advancing age of the participants. The proportions of awareness and controlled HPT were 55% (95% CI: 43%–67%, I^2: 97.7%) and 11% (95% CI: 6%–15%, I^2: 93.8%), respectively. A weak but significant association was observed between HPT and alcohol drinking (summary OR: 1.38, 95% CI: 1.14%–1.65, I^2: 0%) and smoking (summary OR: 1.32, 95% CI: 1.0%–1.74, I^2: 50%). In sensitivity analysis, when a study that made confirmation of HPT by the former World Health Organization criteria was dropped, the prevalence increased to 26% (95% CI: 20.8%–32.1%, I^2: 98.1%).

HPT was considerably prevalent in Myanmar, while the levels of awareness and controlled HPT were low. Health promotion strategy tailored to the education on modifiable risk factors and establishment of blood pressure screening in primary health care context would be of immense value. Upcoming well-powered studies, using the standardized research design and covering more regions of the country are recommended.

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Abbreviations: BP = blood pressure, CI = confidence interval, DBP = diastolic blood pressure, HPT = hypertension, JNC7 = The 7th Joint National Committee, OR = odds ratio, PRISMA = preferred reporting items for systematic reviews and meta-analyses, SBP = systolic blood pressure, WHO = World Health Organization.

INTRODUCTION

Raised blood pressure (BP) or hypertension (HPT) is the most common condition seen in primary care that can lead to myocardial infarction, stroke, renal failure,[1] and death if not detected early and treated appropriately.[2] According to the World Health Organization (WHO) estimate, HPT affects approximately 24.8% of the global population with the range from 19.7% to 35.5% in different regions.[3] Moreover, cardiovascular diseases attributable to HPT account for 4.4% of the global estimate.[4] HPT seems to be dormant in nature and does not always cause symptoms. Hence, people are often unaware that they have HPT. Although HPT is easily diagnosed and treated, many people do not have access to basic health services, particularly in low- and middle-income countries. As such, HPT is responsible for at least 45% of deaths because of heart disease and 51% of deaths because of stroke.[5] Data from the Framingham study showed that those who had high normal BP (systolic blood pressure [SBP]: 130–139 mm Hg and diastolic blood pressure [DBP]: 85–89 mm Hg) compared to those with optimal BP had 1.6 and 2.5 times greater risk of experiencing cardiovascular disease in men and women, respectively.[6] In fact, controlling HPT can prevent further consequences. Specifically, reducing modifiable risk factors can help with prevention and control of HPT for most individuals. Studies showed that decreasing population SBP by 5 mm Hg could reduce deaths because of stroke by 14%.[1] To do so, creating public awareness about "HPT cascade care" that begins with screening is vital to prevention of morbidity and mortality related to HPT.

The Republic of the Union of Myanmar (hereafter, Myanmar) is located in the Southeast Asia, a country rich in natural resources and which is recently emerging in the world stage as a country in peaceful transition to the democracy. Myanmar has an estimated population of 59.13 million in 2009–2010[7] spread over 14 diverse geographical regions[7] with differences in tradition, food habits, and dietary patterns. Data on prevalence of HPT are, however, lacking in most emerging countries.[8] Moreover, the prevalence of HPT may not be homogenous even between regions in a country. Observational studies on the prevalence of HPT in Myanmar, mostly at the

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specific regional locations, have been published. Groundbreaking data emerging from any particular country is an important prerequisite for health care planners in order to formulate a locally feasible strategy that might be effective and efficient. To our knowledge, statistical pooling and analysis of the results of the HPT studies in Myanmar have not been done yet. This initiated us to conduct a systematic review and meta-analysis. Meta-analysis is the process of combining study results that can be used to draw conclusions. The final product has both quantitative and qualitative elements, as it takes into account the numerical results and sample sizes of the individual studies as well as the more subjective issues such as quality, extent of bias, and strength of the study design.[9] Taken together, the objectives of the present study were to synthesize the prevalence, awareness, and control of HPT, and to investigate the risk factors for HPT in Myanmar.

METHODS

The reporting of present review adhered to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) statements[10] (see Checklist, Supplement Content, http://links.lww.com/MD/A66, which indicates the reporting items of study on prevalence of HPT in Myanmar).

Study Search

Relevant studies on the prevalence of HPT in Myanmar in electronic databases (PubMed, MEDLINE, and EMBASE) were searched. The search terms were (MeSH terms or subject headings and free text) for "hypertension" OR "high blood pressure" OR "high BP" AND "Myanmar" OR "Yangon" and restricted to "prevalence" OR "proportion" OR "epidemiology." The search was limited to studies on humans, published in English language, up to March 2014. In addition, we accessed the Index Medicus for South-East Asia Region, the Southeast Asian Regional Office of WHO, and WHO/Myanmar websites, and contacted faculties, scientists, and librarians of the Myanmar medical universities and the Myanmar medical research departments for any unpublished reports whose data were not yet published. We manually searched the references of selected studies for any additional studies that were not captured by the electronic search.

Study Selection

The studies were selected if they met the following criteria stated in the subheadings below.

Study Population

Males and females aged $\geq$15 years, residing in Myanmar, participated.

Study Outcomes

The main outcome was overall prevalence and the levels of awareness and control of HPT. The secondary outcome was risk factors associated with the prevalence of HPT.

Ascertainment of HPT was made by SBP/DBP $\geq$140/90 mm Hg measured twice or the self-reported HPT and on antihypertensive medication as described by the 7th Joint National Committee (JNC7).[11] We also considered the studies that applied the former WHO criteria (SBP/DBP $\geq$160/95 mm Hg)[12] for sensitivity analysis.

Awareness of HPT was defined by self-reporting a prior diagnosis of HPT made by a health care staff (excluding women diagnosed during pregnancy).

Control of HPT was defined as having SBP/DBP $<$140/90 mm Hg in those on antihypertensive medication.

Study Design

Observational studies (cross-sectional, cohort) that were carried out in Myanmar including more than 100 participants and reported prevalence of HPT (or data to calculate it) were included.

Studies were excluded if they did not provide data to estimate the prevalence of HPT, were not community-based studies, or failed to follow the JNC7 standards for self-reported HPT (ie, self-reported HPT without BP measurement and without taking antihypertensive medication).

Data Extraction

The authors independently screened the titles and abstracts collected through the electronic and manual searches for the present study and extracted data, using a piloted data extraction sheet prepared for the current study. Any disagreement was resolved by discussion. Information collected were author, publication year, information on participant's characteristics, survey-related information (year of survey, study location, study design, sampling method, sample size, and data collection tool), and HPT-related information (ascertainment of HPT, number of people with HPT, age and gender-specific data, and risk factors encountered).

The methodological quality of the included studies was assessed in 3 domains: selection bias, measurement bias, and bias related to data analysis, according to the reporting meta-analysis of observational studies (MOOSE) checklist.[13] Selection biases were considered if there was $\geq$20% refusal to participate in the study[8]; nonrandom sampling and data collection was not made through face-to-face interview. Measurement biases were considered on the basis of the type of devices used and measurement methods for BP recording, except for studies that used self-reported HPT. Bias related to data analysis was considered if the design effect was not accounted for the calculation of prevalence.

Statistical Analysis

We recorded the proportions of participants having HPT (prevalence), awareness, and control of HPT extracted from the included studies to perform pooled analyses. The overall prevalence and proportions was calculated using random-effect model of DerSimonian–Laird method.[14] The prevalence from each study was expressed with exact binominal 95% confidence intervals (CIs).

To assess the risk factors for the prevalence of HPT in Myanmar, the odds ratio (OR) and its 95% CI from individualized studies were extracted, and summarized when data were available from two or more studies. We entered the ratio measures of the (adjusted) effect as a log OR and the standard error of the log OR using generic inverse-variance weighting method.[15] We considered only adjusted estimates to minimize the impact of confounding factors on pooled effect measures.

The overall heterogeneity among studies was tested with I^2 index, which describes the percent of total variation contributed by between-study variations.[15] Findings are illustrated in the form of forest plots. We stratified analysis by gender and urban and rural areas. To explore further sources of heterogeneity, a meta-regression was planned to be employed by including the

variables defined *a priori*: the survey year and devices used for BP measurements. However, this has not been feasible because of insufficient number of studies and covariates.

For robustness of results, we performed leave-one-study-out sensitivity analysis by omitting individual studies one at a time from the meta-analysis. This is because duplicate data could be present in the included studies, albeit with tight screening. Furthermore, an individual study was considered to be influential if the pooled estimate, after excluding it, was not within the 95% CI of the original pooled estimate. Assessment of publication bias was planned by visualizing the funnel plot asymmetry. However, as the number of included studies was less than the recommended optimum number of at least 10 studies,[15] the assessment of publication bias was not done. Data entry and analysis were performed using Stata 12.0 (StataCorp LP, College Station, TX) and RevMan 5.3 (Copenhagen, The Nordic Cochrane Centre, The Cochrane Collaboration, 2014). Ethical approval was not required as this study used the published studies and a thesis data set, which was generously provided by the author of the thesis.

RESULTS

Initial search yielded 86 articles, and 4 studies were deemed eligible. Figure 1 shows the PRISMA flow chart of the selection of studies. Three additional studies were obtained from the manual search of the reference lists and personal contacts. Finally, a total, of 7 studies (n = 20,901) were identified for the present review.[7,16–21] Among these were a thesis submitted for a master of medical science degree[20] and 2 WHO-funded surveys.[7,18] Six studies were carried out in the 2000s and only 1 study was in the early 1990s.

Characteristics of the Included Studies

All included studies were cross-sectional designs (Table 1). The studies included participants, ranging from 400[20] to 7429.[7] The largest study was carried out jointly by the WHO and the Myanmar Ministry of Health in 2009, covering 50 of 325 townships in Myanmar.[7] The 2 WHO-funded surveys[7,18] were intended for a package of non-communicable diseases (NCDs) in Myanmar, in which HPT was encompassed.

Not all the included studies were carried out with the same age group or standardized age. Three studies[16–18] were done with participants of age ≥15 years. Three other studies were done with participants of age ≥20,[21] ≥30,[19] and ≥65 years.[20] Three studies were conducted in rural areas,[17,19,20] while 2 studies were in the urban setting.[19,21] The remaining 2 studies were done in both rural and urban areas.[16,18] Of these 7 included studies, 6 studies made diagnosis of HPT by JNC7 criteria (BP

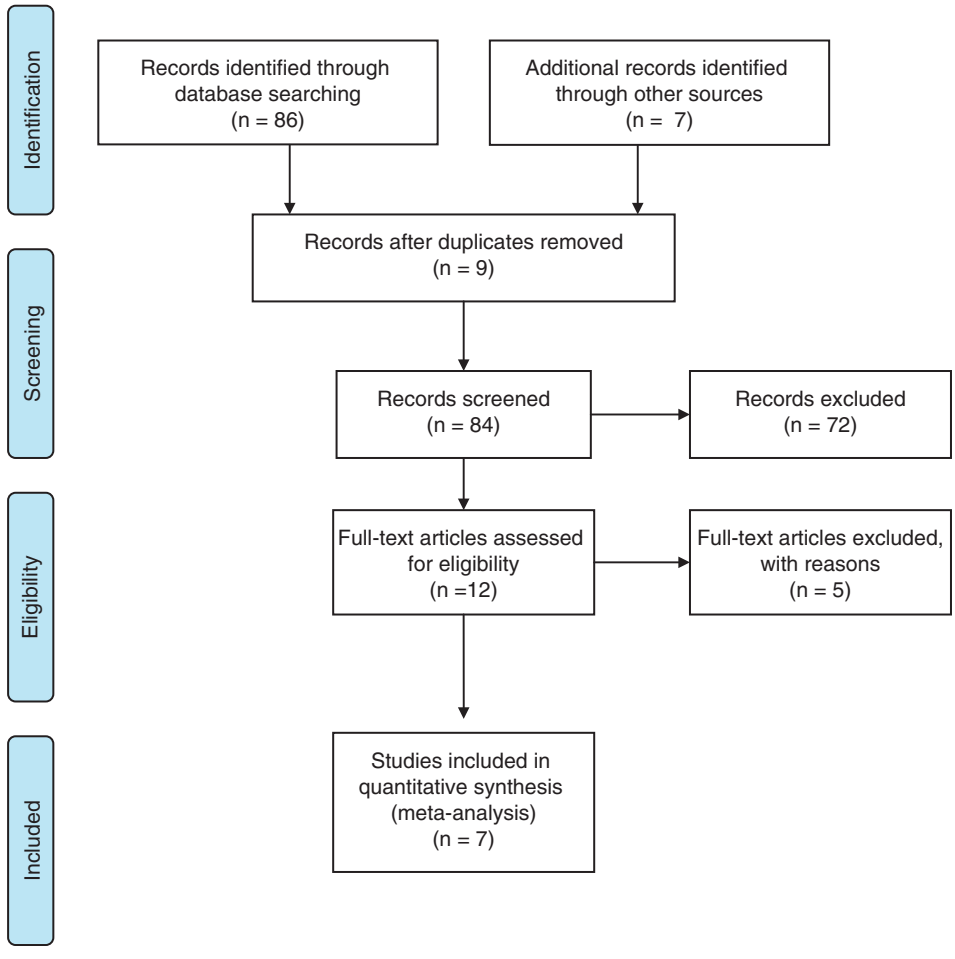

FIGURE 1. PRISMA flowchart of the selection of studies. Adapted from Moher et al.[10]

TABLE 1. Characteristics of Included Studies

No.	Reference, Year of Publication	Year of Survey	Study Area/ Region	Study Design	Total Sample (% M)	Sampling Method	Mean ± SD Age in Years	Instrucument	Number of Measurements/ Measured Used	Prevalence of HPT %	Cutoff Point for HPT, mm Hg	Awareness	Controlled	Non-response Rate %	Risk Factors Assessed
1	Htoon et al, 1992[16]	NA	Yangon/Yangon	CS	2611 (M: 41.4%)	Random	>15	Sphy	1/1	R: 57.9; U: 42.68	160/95	NA	NA	0	Age, SM, OB
2	Shwe et al, 2004[17]	2004	Pa-An/Karen	CS	753 (M: 35.6%)	Nonrandom	Range: 15–82; TYH: 36.6 ± 15.7; MGL: 39.9 ± 16.6	Sphy	2/mean of 2	22.4	≥140/90 or BPLM	NA	NA	10	Age, gender, edu, ALC, SM, H/O
3	WHO, 2004[18]	2003–2004*	Yangon/Yangon	CS	4448	Random	25–74	Digital	NA	25.8%: U; 20.9%: R	≥140/90 or BPLM	NA	NA	19.8**	Age, ALC, PA, OB, DM; CHL
4	Win et al, 2006[19]	2004	Waw/Bago	CS	644 (M: 34.6%)	Random	48.9 ± 15.4	Sphy	2/mean of 2	29	≥140/90 or BPLM	43.9	11.3	NA	Age, gender, edu, MR, OCU; ALC, OB
5	Moe, 2007[20]	2005–2006	POL/Mdy	CS	400 (M: 34%)	Random	≥65	Sphy	3/mean of 3		≥140/90	NA	NA	NA	Age, gender, ALC, PA, OB, DM, salty diet
6	WHO, 2011[7]	2009	National	CS	7429 (M: 38.5%)	Random	15–64	Digital**	Mean of last 2**	25.8****	≥140/90	67.3**	6.4**	NA	
7	Zaw et al, 2011[21]	2003–2004	15 Tsp/Yangon	CS	4616 (M: 45%)	Random	≥20; 50+: >49.2%	Digital	NA	33.8	≥140/90 or BPLM	53.2	16.6	NA	Age, ALC, PA, OB, DM; CHL

ALC = alcohol, BMI = body mass index, BPLM = blood pressure lowering medication (anti-hypertensive medication), CHL = cholesterol, DBP = diastolic blood pressure, Digital = Omron digital blood pressure monitor, DM = diabetes mellitus, edu = education as years of schooling, F = female, H/O = family history of hypertension, HPT = hypertension, M = male, Mdy = Mandalay Region, MGL = Myaning-Ga-Lay, MR = marital status, NA = not available/not mentioned/not described, OB = obesity in terms of BMI >30, Ocu = occupation, PA = physical activity, POL = Pyin Oo Lwin township, R = rural, RS = random sampling, SBP = systolic blood pressure, SM = smoking, Sphy = standard mercury sphygmomanometer, SS = stratified sampling, Toddy = Toddy palm juice drinking, TYH = Ta-Yoke-Hla, U = urban.

*Duration of data collection; **Obtained from another report; ***For >18 years age group; ****For 45–64 years age group.

≥140/90 mm Hg),[7,17–21] while 1 study used the former WHO criteria (BP ≥160/95 mm Hg).[16]

Methodological Quality

Among the included studies, selection bias was likely in 1 study that was done with nonrandom sampling.[17] Nonresponse rate was about 20% in a large-scale survey,[18] while 10% in 1 study[17] and absolutely zero in another study.[16] The remaining studies did not provide such information (see Table, Supplement Content, http://links.lww.com/MD/A65, which illustrates the quality of included studies). Four studies were deemed free from bias related to data analysis as they had taken account of design effect.[16,19–21]

Prevalence of HPT

Overall prevalence of HPT, regardless of gender, age, settings, and BP measurement methods, was available from all 7 studies (n = 20,901),[7,16–21] varying from 5.1%[16] to 33.8%.[21] The summary prevalence of HPT was 22% (95% CI: 14%–31%, I^2: 99.6%) (Figure 2).

Gender-Specific Prevalence of HPT

All 7 studies included in the current meta-analysis provided gender-specific data on prevalence of HPT in Myanmar (Figure 3 A and B). Specific to women (n = 12,382), the pooled prevalence was 22.7% (95% CI: 10.8%–34.6%, I^2: 99.5%). The pooled prevalence of HPT in men (n = 8520) was 21.5% (95% CI: 14.1%–28.9%, I^2: 98.7%).

Age Group-Specific Prevalence of HPT

The prevalence of HPT in the 15–24 years age group was provided in 3 studies (n = 1487).[16–18] The overall prevalence of HPT in this age group was 3.4% (95% CI: 1.6%–7.2%, I^2: 97.8%). Four studies (n = 2198)[7,16–18] provided data for the age group of 25–39 years. The overall prevalence of HPT in this age group was 7.6% (95% CI: 4%–14.4%, I^2: 98.9%). Five studies (n = 2071)[16,18–21] provided data for the age group of 65 years and above, and the overall prevalence of HPT in this group was 32.5% (95% CI: 19.1%–149.5%, I^2: 99.5%) (figure not shown). Overall, the summary is that the prevalence of HPT in Myanmar increased with an advancing age of the participants.

Area-Specific Prevalence of HPT

Two studies (n = 6901)[18,21] reported age-specific prevalence of HPT in urban areas. The pooled prevalence of HPT in the group aged ≥20 with BP ≥140/90 mm Hg for the urban setting was 30% (95% CI: 22%–38.1%, I^2: 99.9%) (figure not shown). Four studies (n = 3960) with BP ≥140/90 mm Hg provided age-specific data for the rural settings[17–20] and the summary prevalence of HPT in the group aged ≥25 years was 23% (95% CI: 20%–27%, I^2: 82.2%) (see Figure, Supplement Content, http://links.lww.com/MD/A60, which illustrates prevalence of HPT among adults in rural Myanmar). It is apparent that the prevalence of HPT in the urban Myanmar is greater than in the rural Myanmar, despite variation in sample sizes and slight difference in age groups of the participants.

Awareness and Control of HPT

The awareness level for HPT was explicitly reported in 3 studies (n = 3233).[7,19,21] The pooled result was 55% (95% CI: 43%–67%, I^2: 97.7%) (see Figure, Supplement Content, http://links.lww.com/MD/A61, which illustrates the awareness of HPT in Myanmar). The same 3 studies provided data on control of HPT[7,19,21] and the overall proportion was 11%

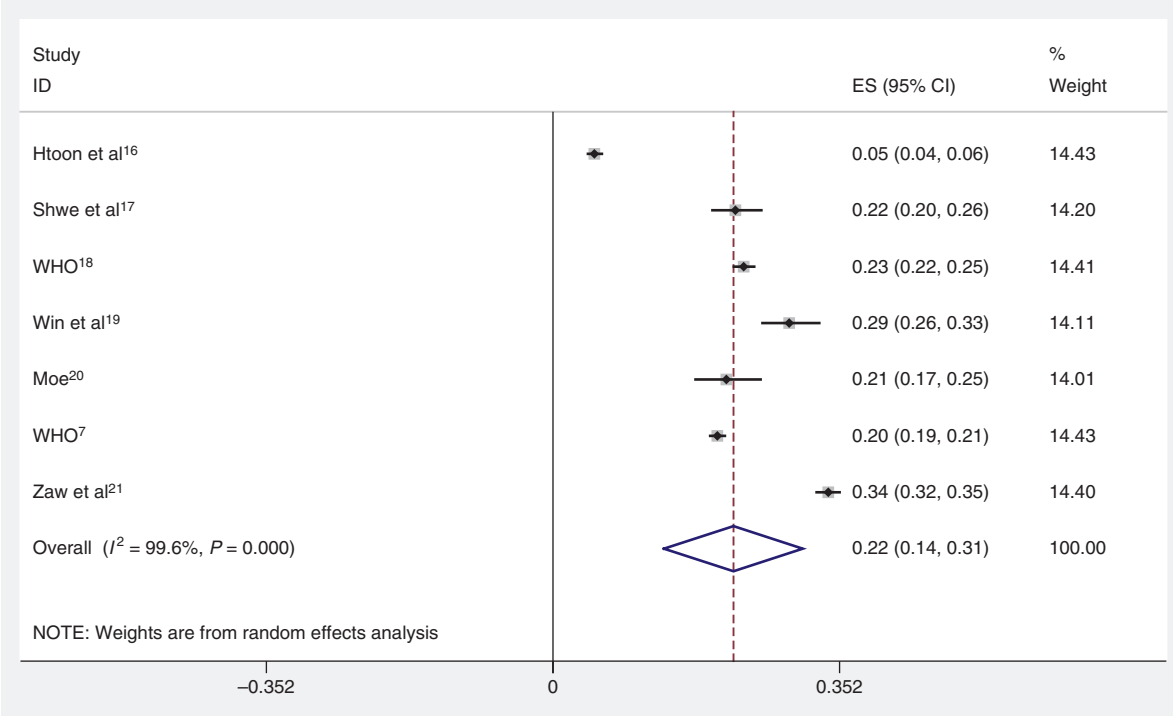

FIGURE 2. Overall prevalence of hypertension in Myanmar.

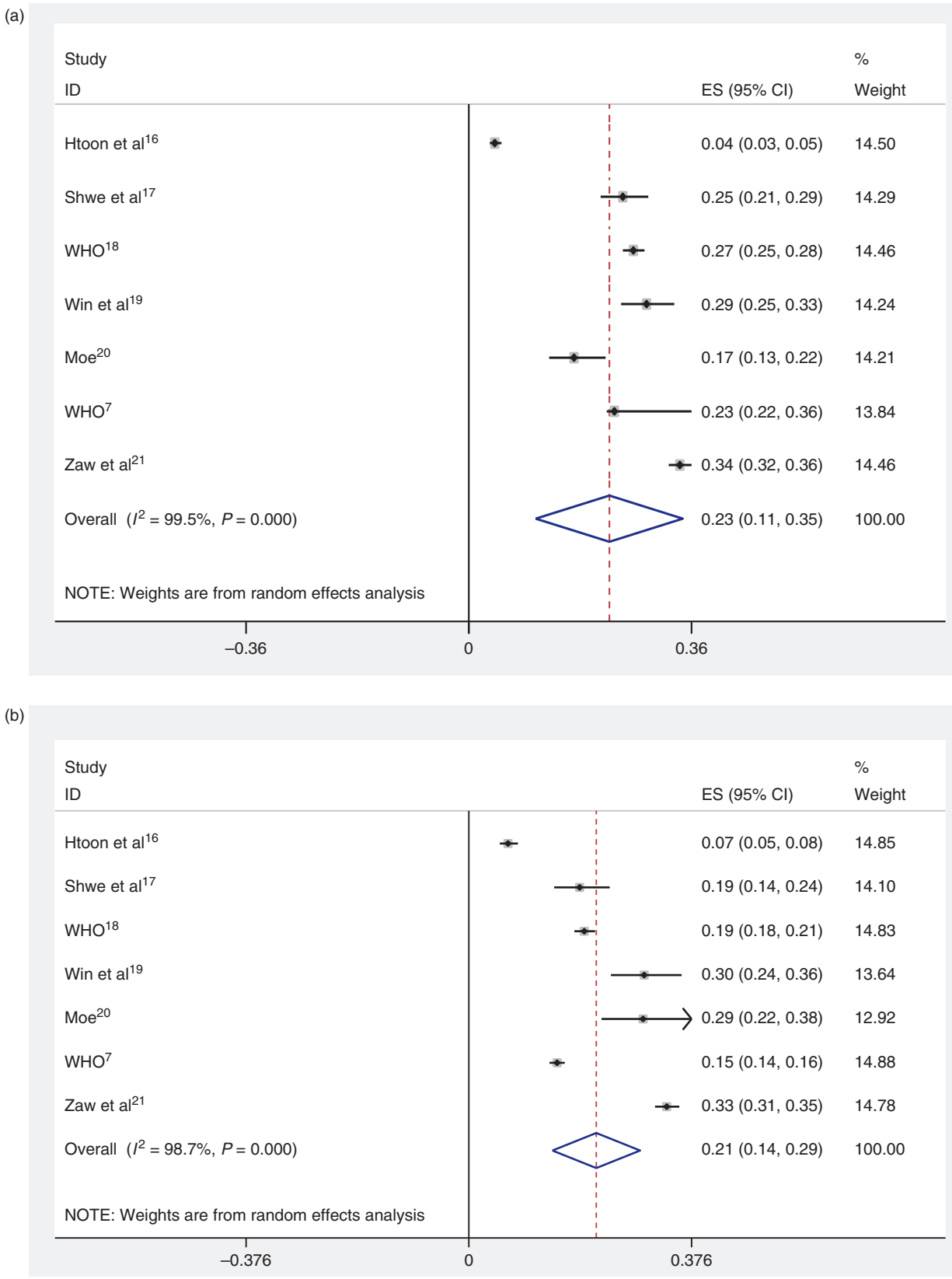

FIGURE 3. Prevalence of hypertension among (A) females and (B) males in Myanmar.

(95% CI: 6%–15%, I^2: 93.8%) (see Figure, Supplement Content, http://links.lww.com/MD/A62, which illustrates the control of HPT in Myanmar).

Risk Factors

For the pooled analysis, we could identify 3 potential risk factors (alcohol drinking, smoking, and diabetes mellitus), which were associated with HPT. Three studies[17,19,21] assessed the association between alcohol intake and HPT and provided data consistently. A weaker but nevertheless significant association was found between alcohol drinking and HPT (summary OR: 1.38, 95% CI: 1.14%–1.65%, I^2: 0%) (Figure 4). The same 3 studies assessed the relationship between smoking and HPT. It tended to show a positive association (summary OR: 1.32, 95% CI: 1.0%–1.74, I^2: 50%) (figure not shown). The relationship between the presence of diabetes mellitus and HPT was assessed only in 2 studies,[20,21] indicating no significant association (summary OR: 0.96, 95% CI: 0.29%–3.19%, I^2: 95%) (see Figure, Supplement Content, http://links.lww.com/MD/A63, which illustrates the association between HPT and diabetes mellitus in Myanmar). Of note, there is a substantial heterogeneity and a wide CI. Other risk factors for HPT such as physical inactivity, high cholesterol level (≥5.2 mmol/L), locally preferred drink/salty food (eg, toddy palm juice, salted dried fish, and salted fish paste),family history of stroke, educational level, and occupation were assessed in some of the included studies. These factors could not be included in this meta-analysis as each factor was addressed only in 1 study or they were reported inconsistently, which precluded aggregating the estimates.

Sensitivity Analysis

For robustness of results, we performed leave-one-study-out sensitivity analysis. When we removed a study,[16] the pooled prevalence of HPT increased to 26% (95% CI: 20.8%–32.1%), which exceeded 95% of the original prevalence (see Figure, Supplement Content, http://links.lww.com/MD/A64, which illustrates the leave-one-study-out sensitivity analysis). Hence, this study that applied the former WHO criteria[16] could have influenced the overall prevalence of HPT in Myanmar.

DISCUSSION

Based on the available data, the present study attempted to synthesize the evidence on prevalence, awareness, and control of HPT in Myanmar. We also provided information on potential risk factors associated with HPT in Myanmar.

The prevalence of HPT documented in the current meta-analysis (ie, 26%; 95% CI: 20.8%–32.1%) was higher than that of a neighboring country Bangladesh (13.5%; 95% CI: 12.7%–14.3%).[22] But it was lower than that for general population in India (29.8%; 95% CI: 26.7%–33.0%)[23] and that in Brazil (36.1%; 95% CI: 28.7%–44.2%).[8] The prevalence of HPT increased with increasing age was found in the current study as well as in other works in China,[24] Brazil,[7] Bangladesh,[22] and worldwide.[25]

With regard to geographical difference, similar to other studies,[23,26] the overall prevalence of HPT in Myanmar was greater in urban areas compared with the rural areas. This could be the result of interaction of multiple factors that are more common in urban population such as sedentary lifestyle,[5,27] increased stress level, and fast food eating.[5] Studies highlighted that the process of urbanization in developing nations is characterized by the progressive disappearance of open areas where natural forms of physical activity can be done.[27] In support of this, greater prevalence of HPT in urban than in rural settings was also reported in the published reviews in China[24] and Brazil.[8]

Although HPT in rural population was less prevalent than in urban population in Myanmar, it is still comparable with overall estimate of 24.2%. This could be related to many factors, and of which might be the relationship between salt intake and HPT that is well documented in meta-analyses with randomized controlled studies.[28–30] Because of paucity of data, the current review is unable to document this potential factor. Of note is that a study included in the current review has supplementary information obtained from a focus group discussion—"*salted fish paste (ngapi in local term) is essential for us. Though it may increase BP, it is cheap and hence, we, as poor people, have to eat it*".[17] Hence, the association between salt intake and HPT in this group of population was compounded by their background socioeconomic status. A study included in this meta-analysis showed that about 90% of participants had been advised to reduce their salt intake by health care staff.[7] This can indirectly imply that salt intake in Myanmar may be an alarming situation. A limited access to diagnostic services and treatments for the developing societies in Myanmar may also be a barrier for prevention of complications of HPT. This was supported by the fact that the low level of awareness and lower level of control of HPT in Myanmar were also comparable with other countries such as

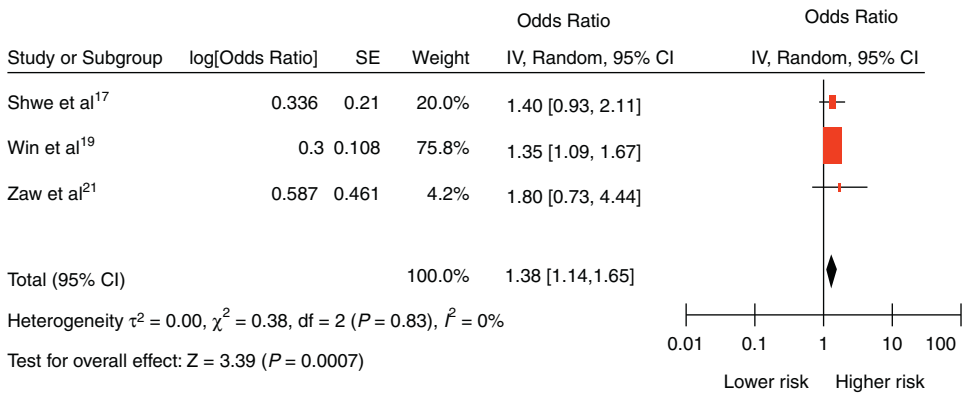

FIGURE 4. Forest plot indicating the association between alcohol drinking and hypertension in Myanmar.

India[23] and Brazil.[8] In view of the existing double burden of communicable diseases and emerging NCD in the developing countries (Myanmar in this case), the disproportionate surge of HPT in these countries appears to come with increased risk for adverse outcomes compared with developed societies.[27]

SBP represents the highest pressure in blood vessels and happens when the heart contracts (beats). DBP is the lowest pressure in blood vessels in between heartbeats when the heart muscles relax. Normal levels of both SBP and DBP are vital for the survival and efficient function of vital organs such as the heart, the brain, and the kidneys, and hence for overall health and well-being.[5] Taken together, it is likely that burden of illness attributable to HPT will continue to escalate unless appropriate measures are initiated to slow down the expected increase in prevalence of HPT in both rural and urban Myanmar.

Strength and Limitations

The current review included adjusted effect estimates to address the potential risk factors in meta-analysis as well as an unpublished thesis document with adequate level of methodological quality, which lends greater strength to our pooled results. Nevertheless, some limitations are to be acknowledged. To explore sources of heterogeneity, it would be ideal to employ a meta-regression by including the variables defined *a priori* and detecting statistical differences in potential risk factors; both of these were limited by insufficient number of the included studies. Only a few studies were carried out with the same age group, which created some difficulties in pooling of age-specific prevalence.

The diagnosis of HPT used in an earlier study was set at the cut-off level of 160/95 mm Hg[16]; it was revised to 140/90 mm Hg and this new criteria was used in the later studies. Therefore, prevalence results in that particular study are likely to be underestimated. On the contrary, because of a selection bias related to nonsampling of participants,[17] the estimated prevalence may have been an overestimation as there is possibility that the persons with disease (HPT in this case) were motivated to participate in the study because of potential benefits provided by the clinicians during the survey.[31] These 2 biases in opposite direction may have rendered our estimates closer to the true estimate. Measurement bias was likely to be present as not all studies did the BP measurement consistently according to recommended guideline. A concern is that for some people, the anxiety of visiting a (medical) doctor might have temporarily raised their BP (white coat syndrome)[5] since the BP measurements were done <3 times as recommended by the standard guidelines.[5,32] We could not assess publication bias because of the small number of studies. Therefore, we are aware that some unpublished studies could have been missed because of inaccessibility, leading to an information bias in the interpretation of the results.

CONCLUSIONS

The findings suggest that HPT is considerably prevalent in both rural and urban Myanmar, while the levels of awareness and control of HPT were not adequately addressed. Escalating early detection and prevention of HPT through health promotion strategy tailored to provide education on modifiable life-styles addressing the health consequences of alcohol consumption and smoking, and dietary pattern and to establish BP screening in primary health care context would be of immense value. Because of the limited number of studies on HPT in Myanmar, upcoming well-powered studies, using the standardized research design and covering more regions of the country, are recommended.

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