Prevalence and Age of Hypertension in Patients with Overt Primary Hypothyroidism in a Tertiary Care Centre in India

Sadikshya Poudel1, Mubashir Angolkar2, Arif Maldar3

1 Department of Public Health Jawaharlal Nehru Medical College, KAHER, Belagavi, Karnataka, India
2 Department of Public Health Jawaharlal Nehru Medical College, KAHER, Belagavi, Karnataka, India
3 Department of General Medicine, Jawaharlal Nehru Medical College, KAHER, Belagavi, Karnataka, India

ARTICLE HISTORY
Received: Apr 10, 2023
Accepted: Jun 10, 2023

ACCESS THE ARTICLE ONLINE

DOI: https://doi.org/10.37080/nmj.158
ISSN : 2645-8438
KEYWORDS
Hypertension; hypothyroidism; thyroid disorders.

CORRESPONDENCE
Sadikshya Poudel
Department of Public Health
Jawaharlal Nehru Medical College,
KAHER, Belagavi, Karnataka, India
Email: saddysaddy925@gmail.com

ABSTRACT

Introduction: There are limited publications of hypertension prevalence in patients with hypothyroidism. This study aimed to analyze the prevalence and age of hypertension among patients with overt primary hypothyroidism in a tertiary care center in India.

Methods: A descriptive cross-sectional study was conducted among hypothyroid patients who consecutively attended a tertiary care hospital in Karnataka, India from 1 November 2020 to 30 September 2021.

Results: A total of 520 overt primary hypothyroid patients with 141 (27.1%) men and 379 (72.9%) women were included in the study (p < 0.05). The mean age of the hypothyroid patients was 52.20 ± 16.414 years, with 58.27 ± 17.339 years of male and 49.95 ± 15.483 years of female (p < 0.05). The prevalence of hypertension among total hypothyroid patients was 225 (43.3%) (39-47.54, 95% CI) with 77 (54.61%) (46.29-62.93, 95% CI) in men and 148 (39.1%) (34.12-43.98, 95% CI) in women (p < 0.05). The proportions of males and females among 225 hypothyroid patients with hypertension were 34.2% and 65.8% respectively (p< 0.05). The mean age of patients with hypertension was 59.97 ± 13.218 years, with 65.39 ± 11.642 years of male and 57.15 ± 13.144 years of female (p < 0.05).

Conclusion: The prevalence of hypertension in hypothyroid patients was similar to prevalence in the general population and was higher in males than in females. The gender-wise distribution of patients with hypertension among hypothyroidism was more in females due to the high proportions of female in patients with hypothyroidism.

INTRODUCTION

Hypothyroidism is a common medical conditions in Nepal and India.1-8 Hypothyroidism prevalence ranges from 2.1% in female medical students to 12.4% in Nepal and from 8.8% to 11.7% in India.1,2,6,8,9 Though the prevalence of hypothyroidism in people with hypertension has been reported,10 there are limited publications about hypertension prevalence in overt hypothyroidism patients. Some reports in India indicated the overall prevalence of hypertension as the comorbidities in patients with hypothyroidism.11,12 such reports are also scarce in Nepal.

The aim of our study was to analyze the age and prevalence of hypertension in male and female among adults with overt primary hypothyroidism in a...
tertiary care centre in India.

METHODS

A descriptive cross-sectional study was conducted among the patients with overt primary hypothyroidism who attended Dr. Prabhakar Kore Hospital and Medical Research Center, Jawaharlal Nehru Medical College (JNMC), the Karnataka Lingayat Education (KLE) Academy of Higher Education and Research (KAHER), Belagavi, Karnataka, India. The duration of the study was one year from the beginning of November 2020 to the end of September 2021. The ethical approval was obtained from Institutional Ethics Committee of JNMC, KAHER, Belagavi (Reference Number: MDC/DOME/258). We have previously reported the prevalence of diabetes in the overt hypothyroid patients with the description of the method.13 We are now reporting the prevalence and age of hypertension in same patients. The patients with overt primary hypothyroidism diagnosed by low thyroxine (T4) and elevated thyroid-stimulating hormone (TSH) were selected out of all the patients with different thyroid disorders.14

The sample size was calculated using the formula. 

\[
n = \frac{Z^2 \times p \times q}{e^2}
\]

\[
= \frac{(1.96)^2 \times 0.05 \times 0.05}{(0.05)^2}
\]

\[
= 385
\]

Where,

- \(n\) = sample size
- \(Z\) = 1.96 at 95% Confidence Interval (CI)
- \(p\) = prevalence of hypertension taken as 50% for maximum sample size
- \(q\) = 1 - \(p\)
- \(e\) = allowable error, 5%

The sample size calculated was 385. With the addition of a non-response rate of 20%, 462 was the required minimal sample size. However, a total of 520 patients with overt hypothyroidism were included in the study. Purposive sampling method was used. Data was tabulated in MS Excel version 16 and analyzed via Statistical Package for Social Sciences (SPSS) Version 20.0. Descriptive statistics, namely mean, standard deviation (SD), and 95% confidence intervals (CIs) were calculated. \(P < 0.05\) was set as a level of significance.

RESULTS

Out of total 520 patients with overt primary hypothyroidism, 141 (27.1%) were males and 379 (72.9%) were females \((p < 0.05)\). The prevalence of hypertension among total 520 patients with overt hypothyroidism was 225 (43.3%) \((39-47.54, 95\% \text{ CI})\) with 77 (54.61%) \((46.29-62.93, 95\% \text{ CI})\) in men and 148 (39.1%) \((34.12-43.98, 95\% \text{ CI})\) in women \((p < 0.05)\) (Table 1). The proportions of male and female among 225 hypothyroid patients with hypertension were 34.2% and 65.8% respectively (Table 2). The mean age of patients with hypertension was 59.97 ± 13.218 years, with 65.39 ± 11.642 years of male and 57.15 ± 13.144 years of female \((p < 0.05)\) (Table 3).

Table 1: Prevalence of hypertension (HT) in patients with overt hypothyroidism (n=520)

<table>
<thead>
<tr>
<th>Patients with hypertension</th>
<th>Total number</th>
<th>Prevalence</th>
<th>95% Confidence interval (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>225</td>
<td>43.3%</td>
<td>(39-47.54, 95% CI)</td>
</tr>
<tr>
<td>Number of male</td>
<td>77</td>
<td>54.61%</td>
<td>(46.29-62.93, 95% CI)</td>
</tr>
<tr>
<td>Prevalence in male</td>
<td></td>
<td>54.61%</td>
<td></td>
</tr>
<tr>
<td>Number of female</td>
<td>148</td>
<td>39.1%</td>
<td>(34.12-43.98, 95% CI)</td>
</tr>
<tr>
<td>Prevalence in female</td>
<td></td>
<td>39.1%</td>
<td></td>
</tr>
<tr>
<td>Difference in male and fe-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male prevalence</td>
<td></td>
<td>(p &lt; 0.05)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Gender-wise distribution of patients with hypertension among overt hypothyroidism (n=225)

<table>
<thead>
<tr>
<th>Gender</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>77 (34.2%)</td>
</tr>
<tr>
<td>Female</td>
<td>148 (65.8%)</td>
</tr>
<tr>
<td>Difference in male and female distribution</td>
<td>(p &lt; 0.05)</td>
</tr>
</tbody>
</table>
### Table 3: Mean age ± SD of the hypertension (HT) in patients with overt hypothyroidism (n=225)

<table>
<thead>
<tr>
<th>Patients with hypertension</th>
<th>Mean age ± SD of total patients (n = 225)</th>
<th>59.97 ± 13.218</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age ± SD of male patients (n = 77)</td>
<td>65.39 ± 11.642</td>
<td></td>
</tr>
<tr>
<td>Mean age ± SD of female patients (n = 148)</td>
<td>57.15 ± 13.144</td>
<td></td>
</tr>
<tr>
<td>Difference in male and female prevalence (p &lt; 0.05)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DISCUSSION

In this study, more than two-third of total participants with overt primary hypothyroidism were women and their mean age was less than that of men. This is consistent with the fact that hypothyroidism is about six times common in female than in male. The thyroid disorder is found most prevalent in the reproductive age group in female. The mean age of male with primary hypothyroidism was more in male than in female.

The prevalence of hypertension among total 520 patients with overt hypothyroidism was 225 (43.3%) (39- 47.54, 95% CI) with 77 (54.61%) (46.29-62.93, 95% CI) in men and 148 (39.1%) (34.12-43.98, 95% CI) in women. The prevalence of hypertension was significantly higher in males than in females. The mean age of patients with hypertension was 59.97 ± 13.218 years, with 65.39 ± 11.642 years of male and 57.15 ± 13.144 years of female. In the general population also, hypertension is shown to be less common in women and younger age groups. A health clinic-based study from India reported the prevalence of hypertension in hypothyroidism to be 11.34%. A community-based study of people aged 18 to 50 years from Pakistan showed that 57.5% of women and 37.5% of men with hypothyroidism had hypertension. The prevalence of hypertension in the general population itself in India is reported to be 30.7% with 21% to 23.7% in women and 24% to 34.2% in men with the prevalence increasing with the increasing age. The hypertension prevalence in the general population in Nepal ranges from 21% to 44.2% based on the different criteria of hypertension. In India, the prevalence of hypertension in the 40 to 69 year old general population ranged from 25% to 49% in females and 28% to 43% in males. The prevalence of hypertension (>140/90) among adults ≥40 years is 36.8% with the prevalence substantially higher in male compared to female.

Hence, the prevalence of hypertension and in women and men with their mean ages in our study patients with overt primary hypothyroidism are similar to those in the general population. The gender-wise distribution of patients with hypertension among hypothyroidism was more in female. Such distribution could be due to the reason that in our study, more than two-third of total participants with overt primary hypothyroidism were women and their mean age was less than that of men. This study demonstrated that hypertension is a common comorbidity in adults with overt hypothyroidism, as in the general population. Hypertension as a cause of mortality in the population is more common than many of the other behavioral risk factors. In patients with overt primary hypothyroidism, hypertension requires special attention while managing the patients.

However, there are some limitations in this study. This was a single hospital based study. Similar studies in community and other hospitals may help to corroborate our findings. Furthermore, there were more female than male patients in this study, which is due to the common prevalence of hypothyroidism in females. Also, the study has not correlated different comorbidities and risk factors of hypothyroidism. Larger study in the community and hospitals may help to analyze various factors.

### CONCLUSION

The prevalence of hypertension in hypothyroid patients was similar to that the prevalence in the general population and was higher in males than in females. The gender-wise distribution of patients with hypertension among overt hypothyroidism was more in female due to the high proportions of female patients in our patients with hypothyroidism. Hypertension requires special attention while managing the patients with overt primary hypothyroidism.

### FUNDING: None

### REFERENCES


