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Original Article

Epidemiology and clinical aspects of white coat hypertension in patients with laparoscopic cholecystectomy in a tertiary hospital, Bangladesh

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ABSTRACT

Background: *The incidence of white coat hypertension is not a rare scenario in surgical practice for which many operations are cancelled each year. In many clinical researches, many possible links and associations have been addressed so far. Moreover, it may have possible associations with operative complications and outcomes.* ***Aims and objective:*** *The aim is to assess incidence, possible relation and clinical aspects white coat hypertension among the patients with elective laparoscopic cholecystectomy.* ***Methodology:*** *This study was a historical cohort study from hospital records with 602 patients who were planned for laparoscopic cholecystectomy under general anaesthesia in Khulna Medical College Hospital, Bangladesh. This was conducted from a period of July 2012 to June 2021. Study population was selected by convenient purposive.* ***Results:*** *In this study, the overall incidence was 5.1% (31 out of 602 patients) where 3.9% (24 patients) were female. It appeared to vary from 1.7% to 7.5% per year since 2012 to 2021. Study results suggest that 70.1% (422) patients of the study population were female. In this research, the incidence of developing white coat hypertension increases with age of the patients and co-morbidities which was assessed by the American Society of Anesthesiologists (ASA) grade. As a result of white coat hypertension, many operations were cancelled in study place. This increased the morbidity and hospital staying of the patients. No difference was detected on the basis of infective complications. But cardio-respiratory and operative bleeding was slightly higher in patients with white coat hypertension. Morbidity was also higher in the same group of patients. No difference was found in relation to mortality.* ***Conclusion:*** *The incidence of white coat hypertension was 1.7% to 7.5% in Khulna Medical College Hospital, Bangladesh over the past few years. It may have relation with the age, sex and co-morbidity of the patients. Cancellation of operation increases the length of hospital stay, cost and hospital*

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burden. Moreover, it increases the overall morbidity and operative complications.

Keywords: *White coat hypertension, incidence, laparoscopic cholecystectomy, complication, morbidity.*

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INTRODUCTION

White coat hypertension is not very uncommon topic in surgical practice. This condition affects patients who experience stress or anxiety at a medical setting such as doctor's office or hospital, characterized by a higher than normal blood pressure reading during their visit. It is named as white coat hypertension because the health care professionals who measure your blood pressure usually wear white coats[1,2]. Some authors use the terms “white coat effect,” “white coat hypertension,” and “white coat syndrome” interchangeably; others suggest “white coat hypertension” is preferred. According to the 2013 European Society of Hypertension/Society of Cardiology guidelines, white coat hypertension characterizes individuals with office systolic/diastolic blood pressure measurements of 140/90 mmHg or higher on at least three occasions, with normal ambulatory or home blood pressure readings (24-hour ambulatory blood pressure <130/80 mmHg or a home blood pressure reading of 135/85 mmHg)[3,4]. On the other hand, the Eighth Joint National Committee in the United States maintains that hypertension should be treated pharmacologically in those individuals older than 60 years who have systolic/diastolic blood pressure measurements of 150/90 mmHg or higher and those younger than 60 years with systolic/diastolic blood pressure measurements of 140/90 mmHg or higher[5]. The failure to adequately diagnose white coat hypertension with standardized measurements has led to the inappropriate prescription and overuse of antihypertensive medications for individuals who are not persistently hypertensive[6].

White-coat hypertension occurs in 15% to 30% of subjects with an elevated office blood pressure, and the phenomenon is reasonably reproducible[7-9]. This condition occurs more frequently in women, older adults, nonsmokers, recently diagnosed patients with hypertension with a limited number of conventional blood pressure measurements in the office setting who have mild hypertension, pregnant women, and subjects without evidence of target organ damage[7,10,11]. This condition is closely linked up with surgical patients with adverse outcomes, reflected in different studies[12,13]. In many circumstances, surgery may be postponed on operation table due to this condition, which ultimately increases morbidity and additional cost in health care delivery system. However, the incidence and different surgical aspects still remain unaddressed and unsettled[13]. Therefore, in this study, our ultimate objective is to find out this issue in a tertiary hospital in our country.

METHODS AND MATERIALS

This study was conducted as a historical cohort study based on hospital record with a total number of 902 cases of cholelithiasis checked in Dept. of Surgery in collaboration with Dept. of Anaesthesiology, Khulna Medical College Hospital, Bangladesh, from a period of July 2012 to June 2021. Records suggest all the patients were examined during pre-anaesthetic check up (PACU). All patients were planned for laparoscopic cholecystectomy under general anaesthesia. Among these 902 patients, 300 patients were hypertensive for different duration, which was excluded from the study population. Study population was selected by convenient purposive sampling based on inclusion and exclusion criteria. Ethical clearance was taken individually from patient and from the ethical review committee of Khulna Medical College Hospital. "European Society of Hypertension/Society of Cardiology guidelines, 2013" and "American Society of Anesthesiologists (ASA) grade[14]" were used as an assessment tool for diagnosis of hypertension.

RESULTS

31 (5.1%) out of total 602 patients of in this study developed white coat hypertension during PACU or on operation table. Age and sex distribution of these patients is shown in table 1 and 2.

	Female			***Male***		
Age group (Years)	**N**	**%**	**Mean±SD**	**N**	**%**	**Mean±SD**
<30	18	3.0	**36±1.8**	00	00	**49±2.1**
30-39	184	30.6		22	3.7	
40-49	91	15.1		85	14.1	
50-60	75	12.5		50	8.3	
>60	54	9.0		23	3.8	
Total	**422**	**70.1**		**180**	**29.9**	

Table 1: Age and sex distribution of study population.

	Female			***Female***		
Age group (Years)	**N**	**%**	**Mean±SD**	**N**	**%**	**Mean±SD**
<30	00	00	**56±2.1**	00	00	**59±2.0**
30-39	03	00		00	00	
40-49	04	5.4		00	00	
50-60	07	8.9		02	0.3	
>60	10	12.5		05	0.8	
Total	**24**	**3.9**		**07**	**1.2**	

Table 2: Age and sex distribution of the patients with white coat hypertension.

American Society of Anesthesiologists (ASA) grade is used to assess the peroperative fitness and categorizing the co-morbidities of the patients[14]. This grading system was applied to the 31 patients out of these total 602 patients. The observation from the records is depicted in figure 1.

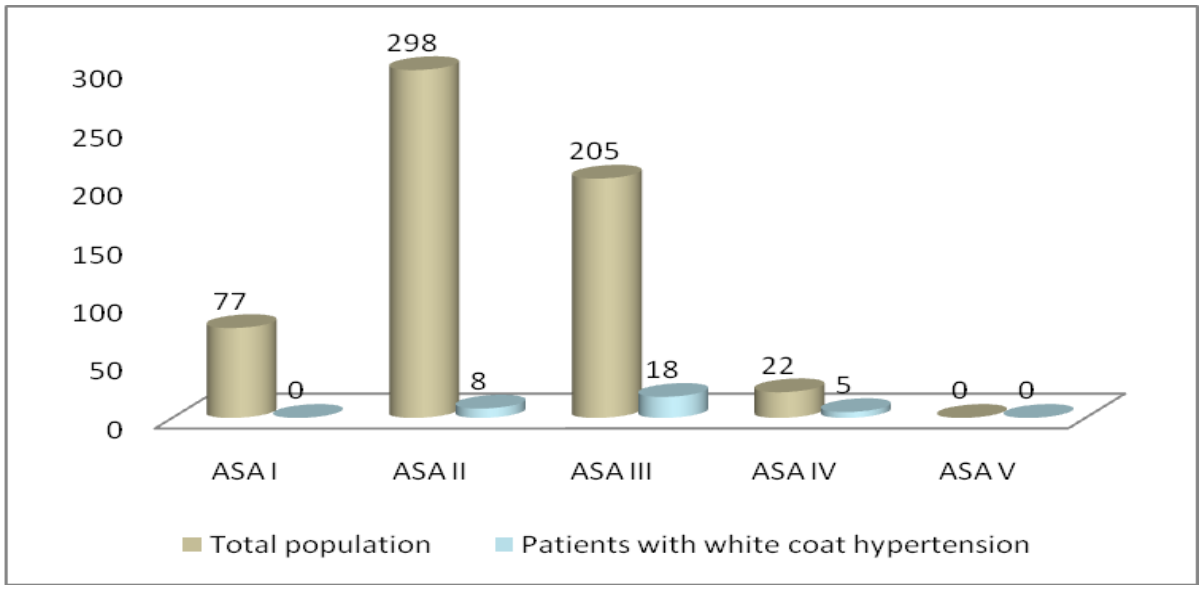

Figure 1: ASA grade of the study population.

Time to control the hypertensive episode is depicted in figure 2. Most often, use of pre-emptive analgesia, anti-hypertensive, analgesic and sedative and acclimatization in OT environment etc. played major role to control "white coat hypertension".

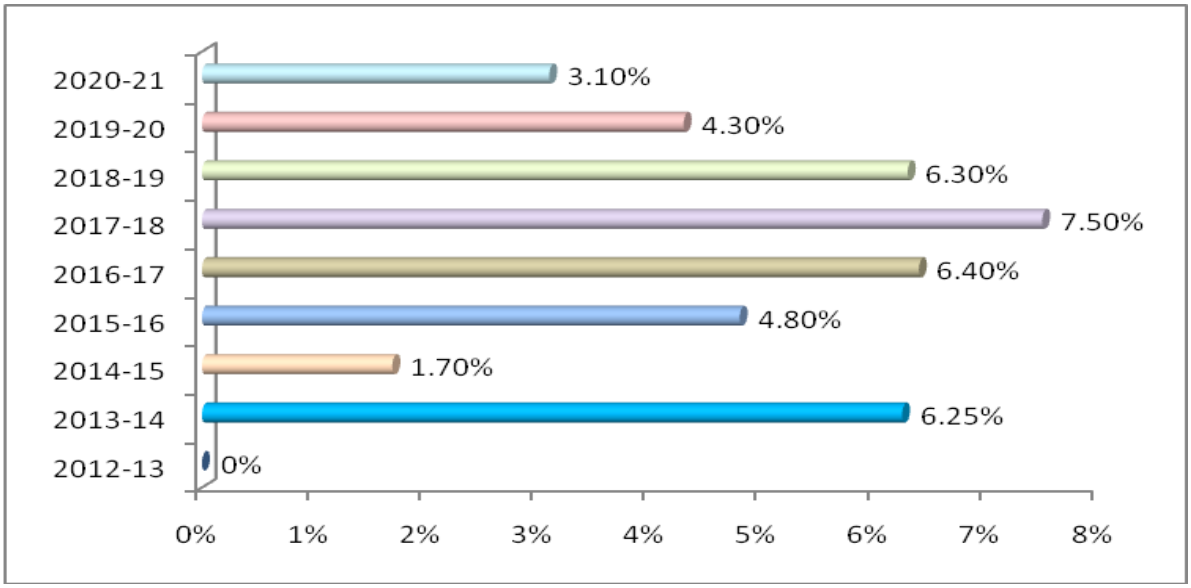

Figure 2: Incidence of developing white coat hypertension by years 2012-21.

From the records of this hospital since 2012 to 2021, overall operative complications, morbidity and mortality is presented in figure 3.

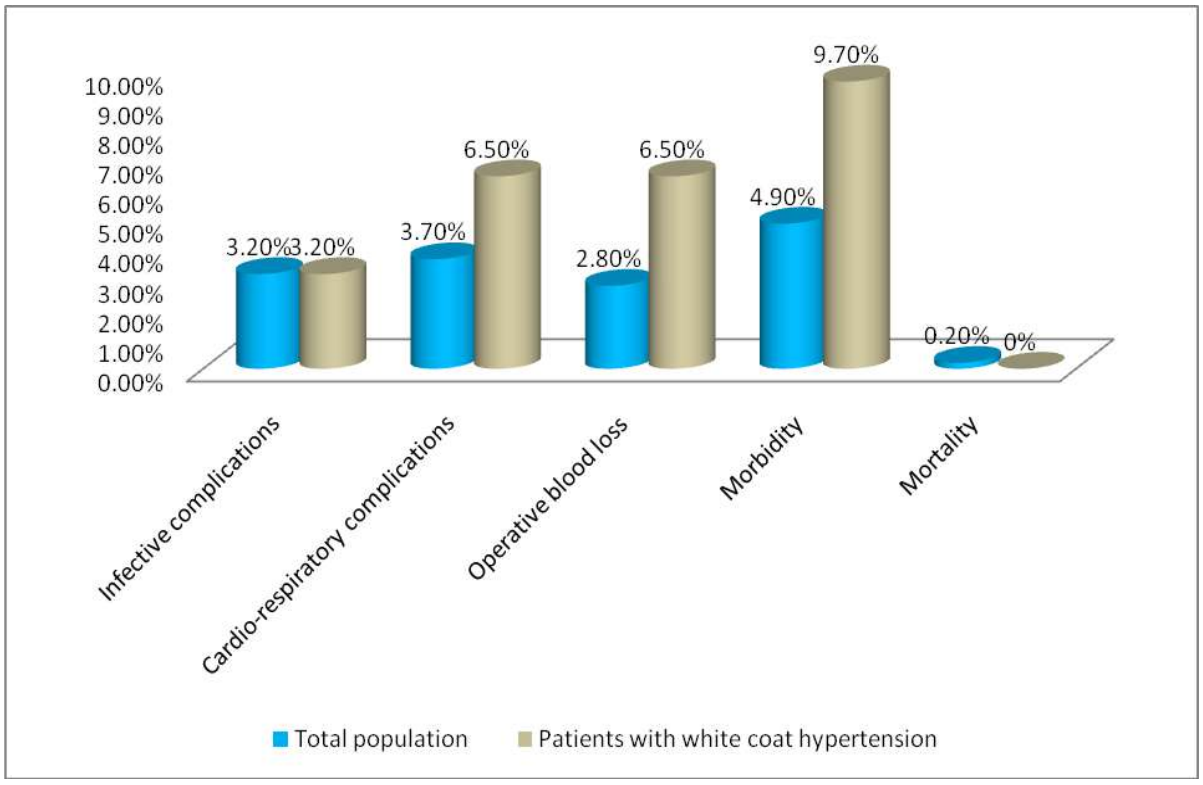

Figure 3: Operative complications, morbidity and mortality.

DISCUSSION

In this study, the previous hospital records of total 602 patients of cholelithiasis were reviewed and analyzed. In these patients, laparoscopic cholecystectomy was planned in routine setup under general anaesthesia. 70.1% (422) patients of this analysis were female. And most of these female patients were in 30-39 years age group (30.6%, 184 patients). On the other hand, 29.9% (180) patients were male and most of these patients were in between 40-49 years (14.1%, 85 patients). Mean±SD age was 36±1.8 and 49±2.1 years respectively in female and male patients.

During preoperative checkup or on operation table before operation, 5.1% (31) patients were detected as having white coat hypertension according to the "European Society of Hypertension/Society of Cardiology guidelines, 2013". Among these 31 patients, 24 patients were female, which was approximately 3.9% of all study population. Mean±SD age was 56±2.1 and 59±2.0 years respectively in female and male patients. One of the significant finding was that the incidence and chance of developing white coat hypertension increases with age of the patients.

American Society of Anesthesiologists (ASA) grade is an excellent preoperative assessment tool to define associated co-morbidity and anticipated risk among the surgical patients[14]. Using this

grading system, it was observed from the record that there is possible link between white coat hypertension and associated other co-morbidities of the patients. In ASA I patients, the overall incidence of developing white coat hypertension was nil. In patients with ASA II and III, it was 2.7% (08 out of 298 patients) and 8.8% (18 out of 205 patients) respectively. On the contrary, the incidence was approximately 22.7% in patients with ASA IV. In this study, there was no case of ASA V.

Hospital statistics reflects that since 2012 to 2021, the overall incidence was in between 1.7% to 7.5% per years in Khulna Medical College hospital, Bangladesh among the patients with elective laparoscopic cholecystectomy. Due to this reason, many operations were cancelled which increased the morbidity and hospital staying and ultimate it increased the budge and burden of health care delivery system in many circumstances. Regarding operative complications, infective complications were mostly same in patients with white coat hypertension and general population. But cardio-respiratory and operative bleeding was slightly higher in patients with white coat hypertension. Morbidity was higher in the respective group, but mortality was same in both groups.

In untreated cohorts in last few years, white coat hypertension was associated with a 38% and 20% increased risk of cardio-vascular disease (CVD) and total mortality compared with normotension, respectively[15]. In the mixed population, white coat hypertension was associated with a 19% and 50% increased risk of cardio-vascular disease and total mortality. Meta-regression analyses indicated that neither differences of clinic blood pressure, nor out-of-office blood pressure variables were correlated with risk of cardio-vascular disease in white coat hypertension[15].

CONCLUSION

White coat hypertension commonly observed in female individual, most often after 60 years. It may be closely linked up with the age and co-morbidity of the patients. Due to this problem many operations are cancelled per years. Therefore, it increases the overall morbidity and operative complications. Moreover, it also increases the length of hospital stay and cost. Preoperative optimization and precaution during surgery is essential to prevent avoidable complications.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. *Celis H, Fagard RH. White-coat hypertension: a clinical review. Eur J Intern Med. 2004;15(6):348–357.*
2. *Mancia G, Bombelli M, Seravalle G, Grassi G. Diagnosis and management of patients with white-coat and masked hypertension. Nat Rev Cardiol. 2011;8(12):686–693.*
3. *Mancia G, Fagard R, Narkiewicz K, et al. 2013 ESH/ESC guidelines for the management of arterial hypertension: the Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC) Eur Heart J. 2013;34(28):2159–2219.*
4. *Sipahioglu NT, Sipahioglu F. Closer look at white-coat hypertension. World J Methodol. 2014;4(3):144–150.*
5. *James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the*

management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8) JAMA. 2014;311(5):507–520.

6. *Dolan E, Stanton A, Atkins N, et al. Determinants of white-coat hypertension. Blood Press Monit. 2004;9(6):307–309.*
7. *O'Brien E, Parati G, Stergiou G, et al.; on behalf of the European Society of Hypertension Working Group on Blood Pressure Monitoring.European Society of Hypertension position paper on ambulatory blood pressure monitoring. J Hypertens. 2013; 31:1731–1767.*
8. *O'Brien E, Coats A, Owens P, Petrie J, Padfield PL, Littler WA, de Swiet M, Mee F. Use and interpretation of ambulatory blood pressure monitoring: recommendations of the British hypertension society.BMJ. 2000; 320:1128–1134.*
9. *Ben-Dov IZ, Ben-Arie L, Mekler J, Bursztyn M. Reproducibility of white-coat and masked hypertension in ambulatory blood pressure monitoring. Int J Cardiol. 2007; 117:355–359.*
4. *Verdecchia P, Palatini P, Schillaci G, Mormino P, Porcellati C, Pessina AC. Independent predictors of isolated clinic ('white-coat') hypertension.J Hypertens. 2001; 19:1015–1020.*
10. *Dolan E, Stanton A, Atkins N, Den Hond E, Thijs L, McCormack P, Staessen J, O'Brien E. Determinants of white-coat hypertension.Blood Press Monit. 2004; 9:307–309.*
11. *Lovibond K, Jowett S, Barton P, Caulfield M, Heneghan C, Hobbs FD, Hodgkinson J, Mant J, Martin U, Williams B, Wonderling D, McManus RJ. Cost-effectiveness of options for the diagnosis of high blood pressure in primary care: a modelling study.Lancet. 2011; 378:1219–1230.*
12. *Colloca L, Finniss D. Nocebo effects, patient-clinician communication, and therapeutic outcomes.JAMA. 2012; 307:567–568.*
13. *Staessen JA, Asmar R, De Buyzere M, Imai Y, Parati G, Shimada K, Stergiou G, Redón J, Verdecchia P; Participants of the 2001 Consensus Conference on Ambulatory Blood Pressure Monitoring. Task Force II: blood pressure measurement and cardiovascular outcome.Blood Press Monit. 2001; 6:355–370.*
14. *Owens WD. American Society of Anesthesiologists physical status classification system is not a risk classification system. Anesthesiology. 2001;94:378.15.*
15. *Huang YH, Weijun MW, Cai XA, et all. , White-coat hypertension is a risk factor for cardiovascular diseases and total mortality, Journal of Hypertension, April 2017;35(4):677-688.*