Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Bibi et al - 2026

DOI: http://doi.org/10.5281/zenodo.21026970

INCIDENCE OF HEMODYNAMIC RESPONSE TO LARYNGOSCOPY AND INTUBATION UNDER GENERAL ANESTHESIA

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Author Details

Keywords:

Hemodynamic reaction, Laryngoscopy, Intubation, Tachycardia, high blood pressure, widespread Anesthesia, ASA reputation, Age organizations, and Rescue drug

Received on 24 Apr 2026

Accepted on 06 Jun 2026

Published on 21 Jun 2026

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Abstract

During laryngoscopy and intubation, 41% of my 100 patients had their heart rate or blood pressure increase. This was higher among males (49.2%) than females (29.3%) and was statistically significant. A higher number of events was seen in ASA II patients (57.1%) as compared to ASA I patients (13.5%). This is not unusual, as individuals who have slight health problems are more likely to be affected by stress. There was also a clear age effect – just 8.7% of the youngest group experienced events, but 55.6% of the oldest group did. The figure of 14% needing a rescue drug only tells me that most events were mild and went away all by themselves. Patients who had an event had a slightly longer laryngoscopy time (16.6 seconds) compared to those without an event (14.0 seconds). However, the event rate was greater for the patients requiring two attempts to tube insertion compared to those inserting the tube on the first attempt (47.6% vs. 39.2%). The most prevalent pattern was for the patient to have both fast heart rate and high blood pressure. Overall, the ASA II status, male sex and age are important risk factors that should be taken into special consideration during intubation.

INTRODUCTION

General anesthesia is a well regulated unconsciousness. This enables the surgeon to conduct surgery without causing any pain to the patient and also without the patient knowing what is being done. In this state, the body's natural protective reflexes, such as coughing, gagging and swallowing are absent. This will facilitate the introduction of the breathing tube, but will also increase the risk of stomach contents entering the lungs or the airway becoming blocked. That is why the airway must be actively secured. The most common way to do this is by putting a tube into the windpipe using a device called a laryngoscope[1]

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Laryngoscopy and installing the respiratory tube aren't gentle tactics. They strongly stimulate the sympathetic frightened gadget, which releases strain hormones like adrenaline. This leads to a temporary but sometimes sharp rise in heart rate and blood pressure. This response begins within seconds, reaches its top in approximately one to two minutes, and commonly settles down inside 5 to 10 minutes [(2),(3)]. In wholesome humans, those adjustments are generally harmless. however in sufferers with coronary heart troubles or high blood pressure, they can trigger risky headaches like chest pain, abnormal heartbeats, or even a strokes [(4),(5)].

Over the past seven decades, numerous studies have documented this presser response. However, the vast majority of these studies have reported only average (mean) changes in heart rate and blood pressure. For example, a study might state that "mean systolic blood pressure increased by 20%." This tells us the average response, but it does not tell clinicians the single most important piece of information: how many patients actually developed a dangerously fast heart rate (above 100 bpm) or a dangerously high blood pressure (above 160 mmHg)? These are the simple, absolute numbers that clinicians need to know in their daily practice to assess risk and make decisions[(6),(7)].

Some studies have compared different intubation devices, such as video laryngoscopes, or tested drugs to blunt the response. Even as those research offers beneficial information approximately variations between gadgets or drug consequences, they not often provide simple occurrence figures. as an instance, they may record that the McGrath video laryngoscope triggered less of an increase in mean blood stress than the Macintosh blade, however they do now not tell us how many patients in every organization virtually crossed the threshold of one hundred sixty mmHg systolic pressure [(8)]. In addition, research that examined pills like dexmedetomidine or lidocaine regularly record mean differences however pass over the percentage of sufferers who advanced considerable tachycardia or high blood pressure notwithstanding the drug [(9)].

Only a handful of studies have supplied partial incidence numbers. Sarkar et al. pronounced that 60% of sufferers had a >20% upward push in systolic blood strain, but they most effective blanketed ASA I sufferers and did no longer use absolute thresholds like HR >100 or SBP >one hundred

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sixty[10]. Silwal et al. suggested that 42.three% of their manage organization had tachycardia and 46.2% had hypertension, but they used composite definitions that blended percentage upward push with absolute values, and they did now not record rescue drug use or hypoxia[11]. Other studies have focused on high-risk populations like elderly or hypertensive patients, making their results difficult to apply to a general surgical population[12].

In Pakistan, there is no published data on the incidence of significant hemodynamic response using simple, clear, absolute thresholds in a general ASA I-II surgical population. There is also no information on how this incidence differs between men and women, between ASA I and II patients, or across different age groups. Furthermore, data on rescue drug use, laryngoscopy duration, and the effect of multiple intubation attempts are missing.

Therefore, this study was designed to fill these gaps. Our aim was to provide straightforward, clinically useful incidence figures – for example, "49.2% of males developed a heart rate above 100 bpm or a systolic blood pressure above 160 mmHg" – rather than just average changes. those numbers are plenty more useful for clinicians making selections in the working room.

METHODOLOGY

This study was carried out at Allama Iqbal Hospital in Haripur, Pakistan. It was an observational study; I did not interfere with the ordinary care but rather observed what occurred, and recorded it. The study lasted for four months. Prior to heading on to this research, I got permission from the Institutional Ethics Committee of the University of Haripur. In this study 100 patients were enrolled. They all were between 16 and 65 years old. They had been taken into consideration to be completely wholesome (ASA I) or to have minor fitness troubles (ASA II) and to have an easy airway (Mallampati elegance I or II). Elective (planned) surgery was being performed on all patients requiring the placement of a breathing tube through the mouth while the patients were asleep. Only patients who provided a written consent were included. I have excluded those who have required emergency surgery, had ASA III and above, had a Mallampati classification of III and IV, known heart or lung

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disease, was pregnant or would be anticipated to have a difficult airway. I measured heart rate and systolic blood pressure at 5 different times. The first reading (T0) was not made until the patient was asleep, but before the laryngoscope was inserted. The second reading (T1) was done during laryngoscopy. The rest of the readings were made after 1, 5 and 10 minutes of breathing tube placement. A extensive response changed into defined as a heart price over one hundred beats in keeping with minute (tachycardia), under 60 beats per minute (bradycardia), a systolic blood pressure of over one hundred sixty mmHg (hypertension), or a systolic blood pressure of below 90 mmHg (hypotension). It was additionally taken into consideration as hypertension whilst the systolic strain expanded with the aid of extra than 20% from baseline. Along with these readings I also recorded if the patient required a rescue drug (labetalol), the time it took for the laryngoscopy, and the number of attempts required to place the tube. I conducted the analysis with SPSS version 27. I worked out the overall incidence by determining the number of patients with a significant event and then dividing this by the total number of patients, giving the answer as a percentage. To compare the incidence between different groups – such as males versus females, ASA I versus ASA II, and the three age groups – I used the chi-square test. I considered a p-value of less than 0.05 as statistically significant. No statistical tests were performed for laryngoscopy duration and intubation attempts, only descriptive statistics (means and percentages) were used.

RESULTS

Demographic Characteristics

One hundred patients had been recruited for the take a look at. of these, fifty-9 (fifty-nine%) have been male and forty-one (forty-one%) have been girl. Thirty-seven sufferers (37%) had been ASA I and sixty-3 (sixty-three%) have been ASA II, 23 of the patients (23%) were elderly 16 to 30 years, forty-one of the sufferers (forty-one%) were aged 31 to 45 years, 36 of the sufferers (36%) were elderly 46 to sixty-five years.

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Subgroups comparison

In total, there were 41/100 patients (41%) with a major hemodynamic event. There was more of a difference when analyzed by gender, with males having a higher incidence (49.2%) than females (29.3%) and this was statistically significant (p = 0.047). ASA II sufferers had a far higher occurrence (57.1%) than ASA I sufferers (13.5%, p < 0.001). The occurrence also improved with age: 8.7% inside the 16-30 group, 46.3% inside the 31-45 institution, and 55.6% in the 46-65 organization (p = 0.001). This is reflected in Table 1, and also in figure 1.

Table 1. Incidence of Hemodynamic Response by Patient Subgroups

Subgroup		Total (n)	Event(yes)	Event(%)	P -value
	Overall Incidence	100	41	41.0	_
Gender	Male	59	29	49.2	0.047
	Female	41	12	29.3	
ASA Status	I	37	5	13.5	<0.001
	II	63	36	57.1	
Age Groups	16-30	23	2	8.7	0.001
	31-45	41	19	46.3	
	46-65	36	20	55.6	

The number of patients with a significant event by gender, ASA (anesthetic risk) status and age group is presented in table 1.

The number of sufferers who had an occasion (fast coronary heart fee or excessive blood pressure) in every organization is as compared within the following table: Out of 100 patients, forty-one (41%) had an event. Of the genders, 49.2% males and 29.3% girls had an event. ASA I patients were less likely to have an event (13.5%) compared to ASA II (57.1%) patients for ASA status. event prices

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jumped with age—simply 8.7% in the youngest organization (16-30), then 46.3% for a long time 31-45, and all of the way up to 55.6% for the ones between 46 and 65. The numbers returned it up: The p-values (gender: 0.047, ASA: <0.001, age organizations: 0.001) display those differences aren't simply through danger. They're statistically significant across the board.

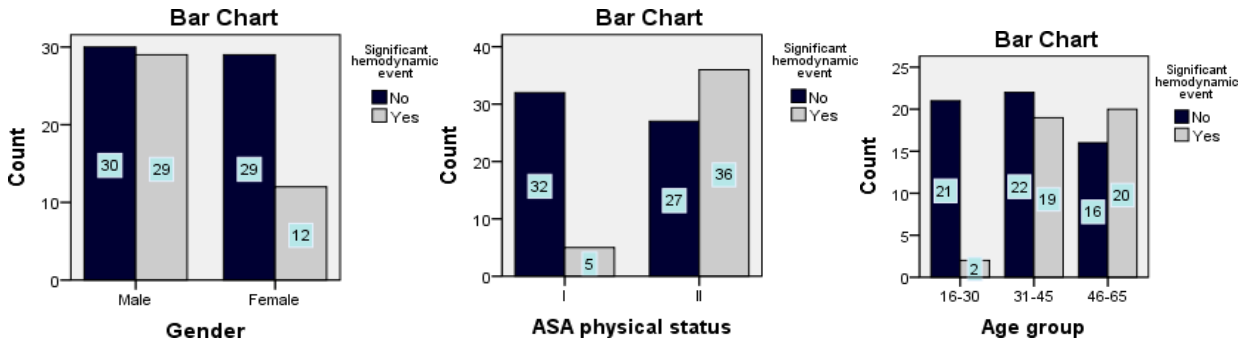

Figure 1. Incidence of Hemodynamic Response by Subgroups

Bar charts showing the incidence of significant hemodynamic response by (a) gender, (b) ASA physical status and (c) age groups are presented in Figure 1.

The first bar chart (a) shows a clear gender difference: the event rate was higher in males (49.2%) than in females (29.3%). In panel (b), the difference by ASA status is even more striking – 57.1% of ASA II patients had a significant event, compared to only 13.5% of ASA I patients. Looking at the age groups in panel (c), the upward trend is obvious; event rates climbed steadily from 8.7% in the youngest group (16-30 years) to 46.3% in the middle group (31-45 years), and further to 55.6% in the oldest group (46-65 years).

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Rescue Drug

Fourteen patients (14%) were given rescue drugs (labetalol). 86% (86 patients) of the subjects did not obtain any drug.

Laryngoscopy Duration

The average laryngoscopy time was 14.0 seconds in patients who did not have an event, and 16.6 seconds in those who did have an event.

Intubation Attempts

Many of the 79 sufferers that have been intubated on the first strive, 31 (39.2%) experienced an occasion. Of the 21 who tried times, 10 (47.6%) had an event.

Type of Response

Of these, 41 patients with event, 11 patients were tachycardia event, 10 patients were hypertension event and 20 patients had both event.

DISCUSSION

The main purpose of this have a look at became to discover how many patients expand a sizable rise in coronary heart charge or blood stress during laryngoscopy and intubation, and to examine the fees between men and women, ASA I and II sufferers, and unique age businesses.

The overall prevalence of forty-one% suits well with what different researchers have determined. Most studies report event rates between 40% and 60% in healthy surgical populations. My results were similar to those of Silwal et al[11], who observed about 42-46% in their control group, but lower than the 60% reported by Sarkar et al, [10]. The differences could be due to variations in patient selection, how the anesthesia was given, or how each study defined a “significant event.”

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Gender seemed to make a difference. Men had a much higher event rate (49.2%) than women (29.3%, p = 0.047), this matches what Shribman et al and Hassan et al found earlier – they suggested that men may have a more reactive sympathetic nervous system[2],[3]. However, since the p-value is only just below 0.05, I would be cautious about over-interpreting this result. It does suggest that male patients might need a little extra attention during intubation.

The biggest difference I saw was between ASA I and ASA II patients. Most effective 13.5% of ASA I patients had an event, in comparison to 57.1% of ASA II patients (p < zero.001). This is not surprising. ASA II patients have mild but real health problems that can make their heart and blood vessels more sensitive to stress. Reddy et al, who studied patients with high blood pressure and heart disease, also reported very high rates of presser response[13].

Age also played a clear role. The event rate went up steadily with age – from 8.7% in the youngest group to 55.6% in the oldest group (p = 0.001). Older patients have stiffer blood vessels and less flexible reflexes, which makes them more vulnerable to sudden changes in blood pressure[2].

Only 14% of patients needed rescue drugs. This tells me that most events were mild and went away on their own. This is what happens in everyday clinical practice – anesthetists do not treat every small rise in heart rate or blood pressure[9].

Sufferers who had an event had a slightly longer average laryngoscopy time (16.6 seconds) compared to folks that did not (14.0 seconds). This suggests that even a few extra seconds of airway stimulation can increase the sympathetic response. Hassan et al, showed that the strength of the presser response is directly related to how intense and how long the laryngoscopy lasts[3].

Similarly, patients who needed two attempts to intubate had a higher event rate (47.6%) than those intubated on the first attempt (39.2%). Smith et al, found that passing the tube past the vocal cords adds significantly to the hemodynamic load[14]. So, aiming for a successful first attempt is not only good practice – it also helps reduce the risk of a presser response.

When I compare my results to studies that looked at different devices, such as Altun et al. (McGrath video laryngoscope) those studies focused mainly on average changes and did not give absolute event

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rates[8]. Bilehjani et al, found that Glide Scope reduced hypertension, but they studied a specific elderly population[12]. My study adds to the existing knowledge by providing simple, absolute incidence numbers that are directly useful for clinicians.

CONCLUSION

In my study, 41% of patients had a noticeable rise in their heart rate or blood pressure during laryngoscopy and intubation. Men, patients with ASA II status, and older patients were found to be at higher risk. Only a small number of patients – 14% – needed rescue drugs, which shows that most events were mild and resolved on their own. Longer laryngoscopy time and having to make multiple try and vicinity the tube each regarded to growth the danger. these effects recommend that paying attention to affected person danger factors and the usage of an easy, green airway method can help reduce the probabilities of tachycardia and hypertension all through intubation.

REFERENCES

Piepho T, Kriege M, Byhahn C, Cavus E, Dörges V, Ilper H, et al. German guidelines for airway management 2023. Die Anaesthesiologie. 2024:1-24.

Shribman A, Smith G, Achola K. Cardiovascular and catecholamine responses to laryngoscopy with and without tracheal intubation. British journal of anaesthesia. 1987;59(3):295-9.

Hassan H, El-Sharkawy T, Renck H, Mansour G, Fouda A. Hemodynamic and catecholamine responses to laryngoscopy with vs. without endotracheal intubation. Acta anaesthesiologica scandinavica. 1991;35(5):442-7.

Mahadevaiah T, Deepak T, Rani R, Vikas K, Shwetha G, Rooparani K. Comparison of hemodynamic response to laryngoscopy using miller and McCoy blade. Cureus. 2022;14(5).

Sachidananda R, Umesh G, Shaikh SI. A review of hemodynamic response to the use of different types of laryngoscopes. Anaesth Pain Intensive Care. 2016;20(2).

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Uddin B, Talukder MH, Ahmed M, Hossain KS, Ahmed F. Hemodynamic Changes Between Endotracheal Intubation And Laryngeal Mask Airway Insertion. Glob Acad J Med Sci. 2022;4.

Pernerstorfer T, Krafft P, Fitzgerald R, Krenn C, Chiari A, Wagner O, et al. Stress response to tracheal intubation: direct laryngoscopy compared with blind oral intubation. Anaesthesia. 1995;50(1):17-22.

Altun D, Ali A, Çamcı E, Özonur A, Seyhan TÖ. Haemodynamic response to four different laryngoscopes. Turkish journal of anaesthesiology and reanimation. 2018;46(6):434.

Seangrung R, Pasutharnchat K, Injampa S, Kumdang S, Komonhirun R. Comparison of the hemodynamic response of dexmedetomidine versus additional intravenous lidocaine with propofol during tracheal intubation: a randomized controlled study. BMC anesthesiology. 2021;21(1):265.

Sarkar J, Anand T, Kamra SK. Hemodynamic response to endotracheal intubation using C-Trach assembly and direct laryngoscopy. Saudi journal of anaesthesia. 2015;9(4):343-7.

Silwal P, Pokhrel N. Hemodynamic Response During Laryngoscopy and Endotracheal Intubation With or Without Low Dose Dexmedetomidine Premedication: An Observational Study. Journal of Society of Anesthesiologists of Nepal. 2023;10(2):8-13.

Bilehjani E, Atashkhoei S, Naghipour B, Loloei F, Fakhari S. Cardiovascular responses to laryngoscopy and tracheal intubation with GlideScope or Macintosh laryngoscope in elderly patients undergoing gynecologic surgery: a randomize clinical trial. Journal of Research in Clinical Medicine. 2023;11(1):15-.

Reddy AG, Ganesh M, Dainy NS. Hemodynamic and Electrocardiographic Responses to Laryngoscopy and Endotracheal Intubation in Adults with Hypertension or coronary artery disease: A Prospective Observational Study. European Journal of Cardiovascular Medicine. 2024;14:1206-10.

Smith P, Smith FJ, Becker PJ. Haemodynamic response to laryngoscopy with and without tracheal intubation. Southern African Journal of Anaesthesia and Analgesia. 2008;14(3):23-6.