A PROSPECTIVE RANDOMISED COMPARATIVE STUDY OF BASKA MASKANDI-GEL FOR AIRWAY MANAGEMENT IN ELECTIVE SURGERIES: FOCUS ON AIRWAY SEALING PRESSURE, INSERTION TIME, AND HAEMODYNAMIC RESPONSE

ABSTRACT

Introduction: General anesthetic procedure requires a safe and open airway. Endotrachealintubationisthegoldstandardforairwaymanagement;it is being replaced by supraglottic airway devices because they are easy to introduce,better tolerated and results in a lesser haemodynamic response. As both the Baska mask and I-gel have a non-inflatable self-sealing mechanism, thesetwodeviceswerecomparedinourstudyintermsoftimetakenforinsertion, airway sealing pressure, the number of attempts, hemodynamic changes, and complications.

Methods: A Prospective comparative study was conducted on 90 patients (45 in each group), aged 18-60 years, undergoing elective surgeries under general anesthesia at Tertiary care Hospital, Madurai. Patients were randomized into two groupsusing the computer generatedstatistical software STATA version14 (Texas, USA):**GroupB**:AirwaywassecuredbyinsertionofBaskamask. **GroupI**:AirwaywassecuredbyinsertionofIGel. Followingassessmentsweredonetoevaluatethe SAD: Time taken to insert the device, airway sealing pressure, rate of successful insertion, number of attempts, Haemodynamic parameters, laryngopharyngeal morbidity. Data were analyzed using Student t-tests and chi-square tests, with $p < 0.05$ considered significant.

Results: The mean airway sealing pressure of the Baska mask (26.1+6.1 cmH2O)wassignificantly higherthanthatof theI-gel (23.1± 5.9cmH2O)witha Pvalue of0.019whichwasstatisticallysignificant. In our study the time taken to insert the device, for Baska mask it was 18.9+4.1 seconds and for the I gel it was 17.2±5.1 seconds with a P value of 0.089 which was statistically insignificant. In our study there was no statistical difference between Baska mask and I-gel groupsinregardstohemodynamicchanges(HeartrateandMeanarterialpressure). This may be due to the same stress response produced by the both devices.

Conclusion: Baska mask is superior to I-gel in positive pressure ventilation under general anaesthesia for short surgical procedureswith statistically significant higher airwaysealingpressurethoughithascomparabletimeofinsertion,haemodynamicchanges and laryngopharyngeal morbidity.

Keywords: supraglottic airway devices, I-gel, Baska mask, general anaesthesia

1. INTRODUCTION

General anesthetic procedure requires a safe and open airway. Two groups of devices, namely tracheal tube guides and supraglottic airway devices (SADs) arecurrentlyused.Endotrachealintubationisthegoldstandardforairwaymanagement;it is being replaced by supraglottic airway devices because they are easy to introduce,better tolerated and results in a lesser haemodynamicresponse.[1]

Supraglottic Airway Devices (SADs) comprise a vast group of tools designed to provide a means for ventilation, oxygenation and administration of anaesthetic gases during situations of respiratory arrest or in a patient who is submitted to a surgical procedure under general anaesthesia. They are used as an alternative to the traditional methods of airway management: the face mask (FM) andthe endotracheal tube (ET).This is a field that has witnessed rapid growth lately, becoming central to everyday anaestheticpractice,whichwarrantscontinuedlearningbypractitioners(anaesthetists) to provide the safest care to their patients.[2]

Three generations of SADs exist. The location of sealing can be either peri- laryngeal or at the base of tongue.

1st generation(inflatablecuff):ClassicLMA, ProsealLMA(PLMA), Combitube

2nd generation (pre-shaped): I gel and SLIPA (streamlined liner of the pharynx airway)

3rd generation (self-energizing): BASKA mask [3].

I-gel™ (Intersurgical Ltd, Wokingham, U.K.) is a novel supraglottic airway device with a non inflatable mask, which is soft, gel-like and transparent, made of thermoplastic elastomer, designed anatomically to seal the hypopharyngeal and perilaryngeal framework. TheI-gel cuff moulds to body temperature to fit the supraglottic region and produces a good airway sealing pressure.[4]. The Baska Mask (PROACT Medical Systems, Frenchs Forest NSW, Australia), designed by Australian anesthetists Kanag and Meena Baska is a supraglottic airway devicewithoutinflatablecuffthatinflatesduringinspirationanddeflates during expiration and has an esophageal drainage inlet and side channels for aspiration ofgastriccontentaswellasanintegratedbite-block.Aninbuilttabfacilitatesinsertionof the device. [5,6]

To date,there are notmany studies comparing the efficacy ofBaska maskVsI gel. Even, a few above stated studies had conflicting conclusions regarding their comparative efficacies.As both the Baska mask and I-gel have a non-inflatable self-sealing mechanism, thesetwodeviceswerecomparedinourstudyintermsoftimetakenforinsertion, airway sealing pressure, the number of attempts, hemodynamic changes, and complications.

The aims of the study are to Compare the efficacy ofBaska maskVs I-Gel in patients undergoing surgery undergeneral anaesthesia. PRIMARYOBJECTIVES: 1) Timetakentoinsertthedevice. 2) Airwaysealingpressure. SECONDARYOBJECTIVES: 1) Rateofsuccessfulinsertionofthedevice. 2) Numberofattempts.
3) Changesinhaemodynamics(HR,MAP). 4) Laryngopharyngealmorbidity-Sorethroat,Dysphagia,Hoarsenessofvoice.

2. MATERIAL AND METHODS

2.1 Study design and setting:

This is a prospective, randomized double blinded comparative study. After obtaining ethical committee clearance for the research, patients were chosen based on the inclusion and exclusion criteria. **INCLUSIONCRITERIA: 1)** Patientsagedbetween18-60yearsofeithergender. 2) Patients belonging to ASA Class I or II (American Society of Anesthesiologists). 3) PatientswithBMI<30Kg/m^2. 4) Patientsundergoingelectivesurgeriesofshortduration<2hours **EXCLUSIONCRITERIA 1)** Patientscomingforemergencysurgeries**. 2)** PatientsbelongingtoASAIIIandIV**. 3)**Patients with a history of hiatus hernia or full stomach or GERD (Gastro esophageal reflux disease)**. 4)** Patients with a history of obstructive sleep apnoea, asthma, mental retardation, congenital heart disease**. 5)**

Recenthistoryofupperrespiratorytractinfection(<7days). **6)** Patientsrequiringrapidsequenceinduction. **7)** Patientswithanticipateddifficultairway

2.2 Sample size:

Samplesizewasestimatedfrompreviousstudydone**AbdelRaofAbdelAzizetal**[13] assumingpowerat80%andconfidencelimit95%. The sample size was calculated to be 90 cases. (45 cases in each group).

After obtaining Institutional Ethics Committee approval (IEC), patients wereselected based on inclusion and exclusion criteria and informed consent was obtained after explaining the study. Demographic data such as weight, height, body mass index (BMI) and gender were recorded in the proforma.The final sample size was arrived at 45 in each group [90 in total].

Randomisation and Allocation concealment:

Patients who fulfilled the inclusion and exclusion criteria and were willing to participate in the study were allotted to either of the 2 groups based on computer-generated randomization. The random numbers were generated using the statistical software STATA version14 (Texas, USA) and allocated into:

GroupB:AirwaywassecuredbyinsertionofBaskamask.

GroupI:AirwaywassecuredbyinsertionofIGel

Allocation concealment was ensured using the SNOSE [Sequentially numbered opaque sealed envelopes.

2.3 Study procedure:

On previous day of surgery pre anaesthetic assessment was done, patients were selected based on inclusion and exclusion criteria. Anaesthetic plan and study was explained and consent was obtained. Continuation or discontinuation of drugs and NPO (Nil per oral) orderswere given as per accepted routine ASA guidelines.

Onthedayofsurgerypatientwasidentified,NPOwasconfirmed,andconsent for anaesthesia and participation in the study was checked. The patient was shifted to operation theatre intravenous (IV) access secured, standard monitoring including ECG, NIBP, SpO_2 were connected, pre oxygenated with 100% oxygen for 3 minutes andinducedwithIVGlycopyrrolate0.2mg,IVMidazolam1mg,IVFentanyl(2mcg/kg)andIVPropofol (2-3mg/kg)intitrateddoses.Afterchecking for theeaseofmanual ventilation, the patient was paralysed with IV Vecuronium (0.1mg/kg) and bag mask ventilation done for 3min with 100% O_2.

After3minofmanualventilation,eitherBaskamaskorI-Gelofadequatesize as per manufacturer's guidelines was placed with the patient's head in the sniffingposition. All the devices were placed by the same experienced anaesthesiologist with at least 15 placements previously.

Adequate placement and ventilation was determined by auscultation of breath sounds,chestwallmovement,andsquarewavecapnography.Then,onceposition and adequacy of ventilation were confirmed, SAD was fixed with an adhesive tape. After successful placement, a well lubricated nasogastric tube was inserted into the drainage channel to facilitate gastric drainage.

Thenthepatientsweremechanicallyventilatedusingvolumecontrolled ventilation maintained with 1-1.5% Isoflurane, oxygen and air (FiO_2 50%) and neuromuscularblockademaintainedwithbolusesofVecuroniumasandwhenrequired.At the end of the surgery, patients were reversed with IV Glycopyrrolate (0.01mg/kg) and Iv Neostigmine (0.05mg/kg) once patients had spontaneous efforts. Anaesthetic gas mixture was replaced with 100% O_2 to facilitate patient's recovery. The SAD was removed after the patient regained consciousness and responded to oral commands.For laparoscopic surgeries, intraperitoneal pressure was maintained between 12 to 14 mmHg.

FollowingassessmentsweredonetoevaluatetheSAD:

1. **Timetakentoinsertthedevice**:Insertiontimeneededforplacementofthe SADwas defined as time in seconds frompicking up SAD to the firstrecorded near rectangular capnogram curve.
2. **Airwaysealingpressure**
   Determinationofsealingpressure: Thepressureatwhichleakstarts.This leak pressure was calculated as the plateau airway pressure reached with freshgas flow 6l/min, and pressure adjustment valve set at 70 cmH2O.
3. **Rate of successful insertion**: Definedas presence of EtCO2andchest raise after placing the SAD in either one or two attempts.
4. **Numberofattempts**requiredforsuccessfulinsertionofthedevicewasnoted. An attempt is defined as the placing of the supraglottic airway device within the oropharynx to secure the airway.If the first two attempts of insertion failed then it would be considered as failure of insertion and patient would be intubated with endotracheal tube to proceed with the surgery. That patient would be excludedfrom the study.
5. **Haemodynamic parameters** (Heart rate, Mean arterial pressure pre-insertion (Baseline), post-insertion 1 Min 5 Min and 10Min.
6. **Laryngopharyngeal morbidity** Incidence of sore throat, dysphagia, and hoarsenesswere noted 1 hourafterextubation and 24 hrs postoperative.

2.4 Statistical analysis:

Data analysis was done with the help of computer using SPSS Statistics 20.0 software (SPSS Inc. BengaluruIndia).Chi- square test and fisher'sexact testwere used to find out association between the categorical variables.Independent 't'-test was used to find the significance difference between groups. P<0.05 was considered as statistically significant

2.5 Ethical clearance:

The patient and attendees were explained about the procedure and the expected complications. They were informed about the present study and their eligibility for participating in the study. Only patients who were willing to participate were included and informed consent was obtained. The study was approved by the Institutional Ethical Committee [NBE/CNS/DNB PDCET/41159]

3. RESULTS AND DISCUSSION

We finally recruited around 90 patients [45 in each group] who fulfilled the inclusion criteria [0% non-response rate]. The mean age in B and I group was 40.7±10.7 years and 40.5±11.0 years respectively. The percentage of male patients in group B and I are 57.8% and 55.6% respectively. The percentage of female patients in group B and I are 42.2% and 44.4% respectively). TheaverageweightofpatientsingroupBandIwas63±9.5Kgsand62.7±13 Kgs respectively with a P value of 0.892.TheaverageheightofpatientsinGroupBandIis160.2±8.7cmsand 159.4±11.1cms respectively with a P value of 0.712.TheaverageBMIofpatientsinGroupBandGroupIis24.4±2.6kg/m2and24.5±3.0Kg/m2respectivelywithaPvalueof0.887. The percentage of patients belonging to ASA 1 and 2 in Group B was 60% and40% respectively. The percentage of patients belonging to ASA 1 and 2 in Group I was 64.4% and 35.6% respectively. ThepercentageofpatientsbelongingtoMallampaticlassification1and2in Group B was 55.6% and 44.4% respectively. The percentage of patients belonging to Mallampati classification grade1 and 2 in Group I was 66.7% and 33.3% respectively. There was no statistically significant difference in the sociodemographic variables in the two groups (>p=0.05) and they were comparable.

Table 1: Comparison of sociodemographic parameters (age, height, weight, BMI, gender) ASA classification, Mallampati classification across the study groups, N=90

	Group	

	B		I		
	Mean	**SD**	**Mean**	**SD**	
Age(in years)	40.7	10.7	40.5	11.0	0.961
Weight (inKgs)	63.0	9.5	62.7	13.0	0.892
Height (inCms)	160.2	8.7	159.4	11.1	0.712
BMI (inKg/m2)	24.4	2.6	24.5	3.0	0.887
Parameter	**Number of patients**	**%**	**Number of patients**	**%**	**P VALUE**
GENDER					
Male	26	57.8%	25	55.6%	0.832
Female	19	42.2%	20	44.4%	
ASA					
ClassI	27	60.0%	29	64.4%	0.664
ClassII	18	40.0%	16	35.6%	
Mallampati Classification					
Grade1	25	55.6%	30	66.7%	0.280
Grade2	20	44.4%	15	33.3%	

Themeandurationofsurgeryingroup BandIwere89.9±20.7minutesand 88.2±17.8minutesrespectively.
BoththegroupsBandIarecomparableintermsoftypesofsurgeries. Statistically there was no significant difference between two groups(P value >0.05) andthey were comparable

Table 2: Comparison of duration of surgery, type of surgery across the study groups, N=90

Parameter	Group				P-Value
	B		I		
	Mean	SD	Mean	SD	
Duration (InMinutes)	89.9	20.7	88.2	17.8	0.691
Parameter	**Number of patients**	**%**	**Number of patients**	**%**	**P- value**
TYPE OF SURGERY					
Debridement	18	40%	20	44.4%	0.778
LapAppendicectomy	13	28.9%	14	31.1%	
LapCholecystectomy	14	31.1%	11	24.4%	

FirstattemptsuccessrateingroupBandIwas84.4%and93.3%respectively.
Secondattemptsuccessratewas15.6%and6.7%respectively.
Statisticallytherewasnosignificantdifferencebetweentwogroupsintermsof number of attempts (P value 0.180) and they were comparable.

Timetakentoinsertdevice in group B was 18.9±4.1 seconds and in group I was 17.2±5.1 seconds. Statistically there was no significant difference between two groups in terms of time taken to insert device (P value 0.019) and they were comparable. Airway sealing pressure in group B was 26.1±6.1 cmH_2O and group I was 23.1±5.9 cmH_2O. Statistically there was significant difference between two groups in terms of airway sealing pressure (P value 0.019).

Table 3: Comparison of Number of attempts, Time taken to insert the device, Airway sealing pressure across the study groups, N=90

NUMBER OF ATTEMPTS	Group				P-Value
	B		I		
	Number of patients	%	Number of patients	%	
1	38	84.4%	42	93.3%	0.180
2	7	15.6%	3	6.7%	
Parameter	**Number of patients**	**%**	**Number of patients**	**%**	**P- value**
TIME TAKEN TO INSERT THE DEVICE					
Time(Inseconds)	18.9	4.1%	17.2	5.1%	0.089
AIRWAY SEALING PRESSURE					
Airway sealing pressure (In cm of H2O)	26.1	6.1%	23.1	5.9%	0.019

The change in Heart Rate at Baseline, 1, 5, 10 minutes in Group B was 80.5±17.4 mins, 85.9±17.7 mins, 83.6±17.1 mins, 80.7±16.2 mins respectively. The change in Heart Rate at baseline, 1, 5, 10 minutes in Group I was 83.4±16.1 mins, 88.4±17.6 mins, 83.8±15.8 mins, 81.3±15.1 mins respectively.

Statistically there was no significant difference between two groups in terms of change in heartrate atbaseline,1,5,10 minutes (P valuewas0.405,0.505,0.959 and0.869) and the results were comparable. The Average of MAP at Baseline,1,5,10 minutes in Group B was 81.1±10.7mmHg, 90.5±13.4 mmHg, 82.0±11.3 mmHg, 78.5±10.0 mmHg respectively. TheAverageofMAPatbaseline,1,5,10minutesinGroupIwas79±8.6mmHg, 86.8±12.3mmHg,78.7±9.6mmHg,75.2±8.2mmHgrespectively. Statistically there was no significant difference between two groups in terms of change in MAP at baseline,1,5,10 minutes (P values were 0.309, 0.169, 0.140, 0.084) respectively and they were comparable.

Table 4: Comparison of hemodynamic parameters [Heart rateand mean arterial pressure during the time intervals across the study groups, N=90

Heart rate atnthminute	Group				P-Value
	B		I		
	Mean (inbeats per minute)	SD	Mean (inbeats per minute)	SD	
Baseline	80.5	17.4	83.4	16.1	0.405
1	85.9	17.7	88.4	17.6	0.505
5	83.6	17.1	83.8	15.8	0.959
10	80.7	16.2	81.3	15.1	0.867

MAP At nthminute	Group				P-Value
	B		I		
	Mean (InmmHg)	SD	Mean (InmmHg)	SD	
Baseline	81.1	10.7	79.0	8.6	0.309
1	90.5	13.4	86.8	12.3	0.169
5	82.0	11.3	78.7	9.6	0.140
10	78.5	10.0	75.2	8.2	0.084

57.8% of patients in group B and 60% of patients in group I had sore throat after 1hour of extubation. 42.2%ofpatients in group B and 40%ofpatients in group I had no sore throat after 1hour of extubation. There

was statistically no difference between two groups in terms of presence or absence of sore throat after 1hour of extubation (P value 0.830) and they were comparable. 6.7% and 11.1% of patients had sore throat after 24 hours of extubation in groupB and I respectively.93.3% and 88.9% of patients had no sore throat after 24 hours of extubation in group B and I respectively. The results were statistically insignificant (P value 0.459) and the results were comparable. 2.2%ofpatientsingroupBhaddysphagiaafter1hoursofextubationandnone in the group I had similar complaints. 97.8%ofpatientsingroupBand100%ofpatientsinGroupIhadnodysphagia after 1 hours of extubation. Therewasstatisticallynodifferencebetweentwogroups(Pvalue0.315)andthey were comparable. NoneofthepatientsineithergroupBorIhaddysphagiaafter24hoursof extubation. NoneofthepatientsineitherofthegroupBorIhadhoarsenessofvoice after 1hour and 24 hours of extubation

Table 5: Comparison of complications (sore throat after 1 hour of extubation, after 24 hours of extubation, dysphagia after 1 hour of extubation) across the study groups, N=80

Sorethroat after1hour of extubation	Group				P-Value
	B		I		
	Number of patients	%	Number of patients	%	
Present	26	57.8	27	60.0	0.830
Absent	19	42.2	18	40.0	

Sorethroat after 24 hours of extubation	Group				P-Value
	B		I		
	Number of patients	%	Number of patients	%	
Present	3	6.7	5	11.1	0.459
Absent	42	93.3	40	88.9	

	Group				

Dysphagia after1hour of extubation	B		I		P-Value
	Number of patients	%	Numberof patients	%	
Present	1	2.2	0	0.0	0.315
Absent	44	97.8	45	100	

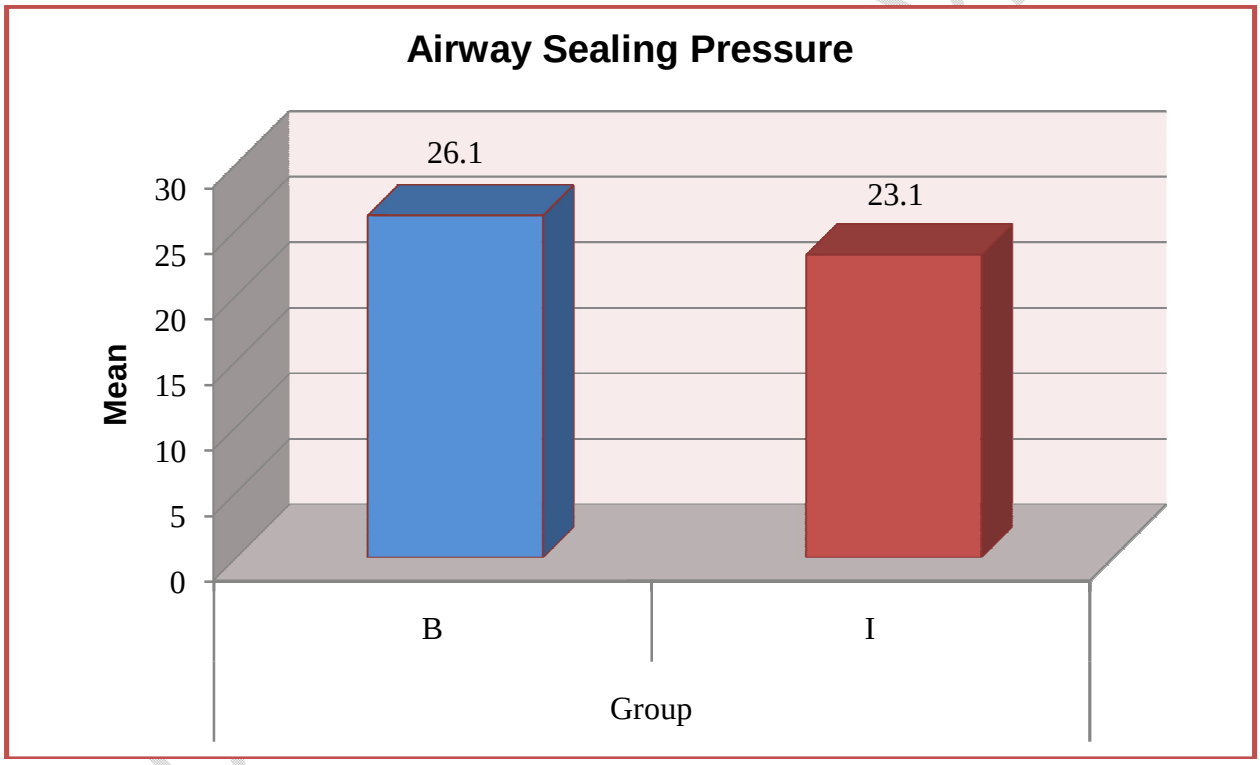
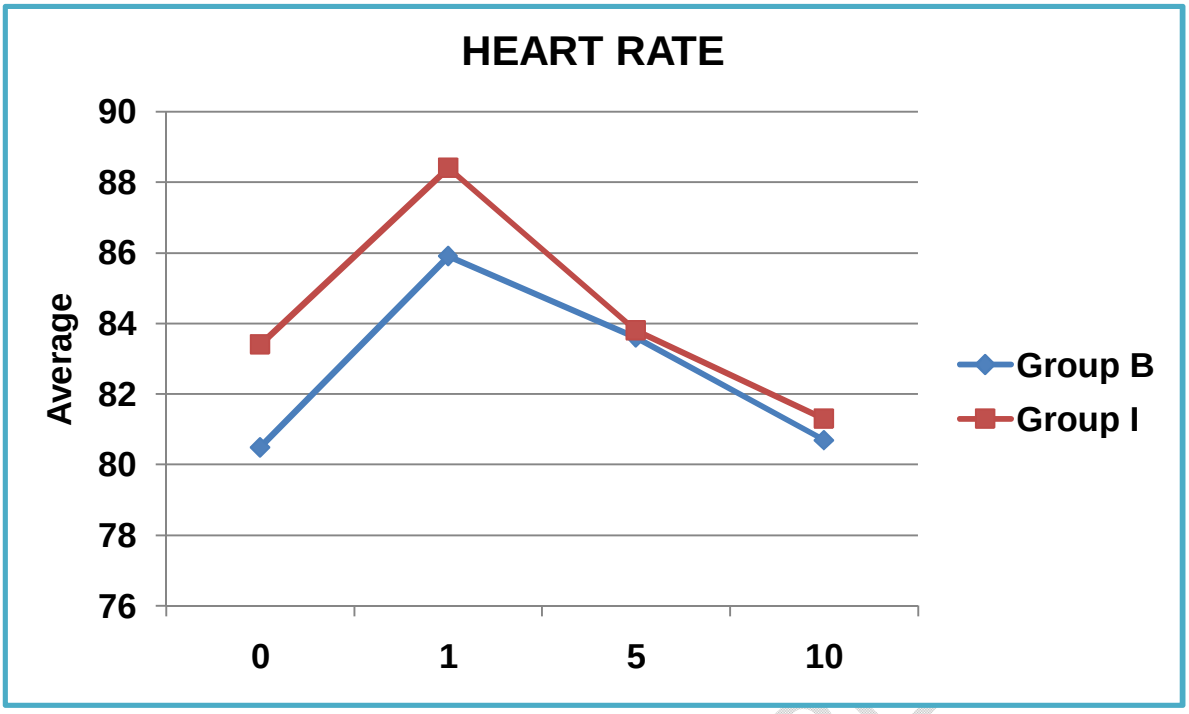


Fig 1: Comparison of airway sealing pressure within the study groups, N=90



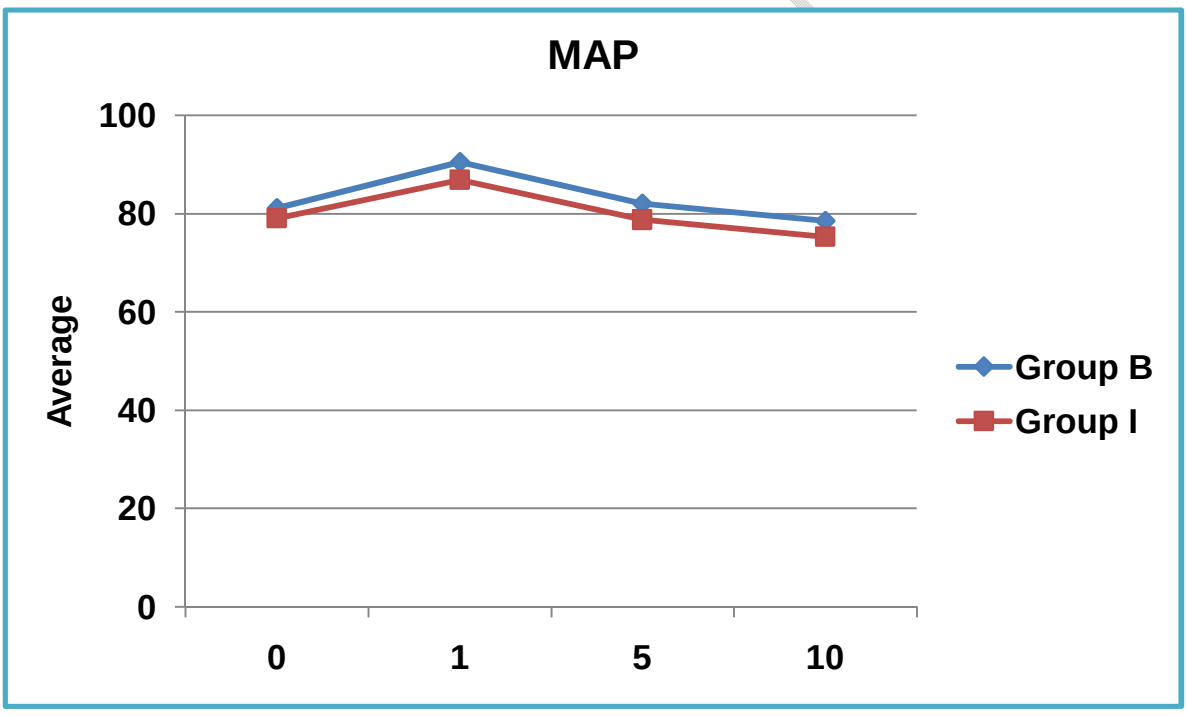


Fig 2: Comparison ofhemodynamic parameters [Heart rateand mean arterial pressure) during the time intervals within the study groups, N=90

4. Discussion:

TheusageofSADshasbeengrowingrapidlyespeciallyforoutpatient procedures avoiding tracheal intubation which needs laryngoscopy and sometimesmuscle relaxants. Their usage also decreases the risk of dental lesion, sore throat, myalgia, muscle weakness, post operative nausea and vomiting. Inserting SADs is generally less stimulating for the autonomic nervous system, resulting in lesser cardiovascular events.

The main shortcoming of SADs is the risk of pulmonary aspiration. Proper esophagealsealingconstitutesabarriertotheentryofregurgitatedgastricfluidinto the pharynx similarly peri-laryngeal sealing stops fluid from entering the airway. These minimizetherisk,butdependontheshapeandsizeofthedeviceandthematerial which it is made out of. The SADs with less risk of aspiration are those which show high pharyngeal and esophageal sealing pressures, appropriate pharyngeal size, malleable material (regardless of being cuffed or not), and a draining channel. [(2)]

Over the years SADs have become indicated for a growing number of scenarios includingextremelyinvasiveandprolongedsurgeries.Thisisespeciallytrueforthe newer SADs,which have specific features for added safety. [(2)]An ideal SAD should be easy to insert and hasless insertion time, good airwayseal pressure, and minimum laryngopharyngeal morbidity.

Abdel Raof Abdel Aziz et al[(13)] in his study showed that Oropharyngeal sealing pressure (OSP) was significantly higher following Baska mask insertion than I gel, intra and postoperative airway morbidity rates were not significantly different between both groups. **Shivani Fotedar** [(14)] in a study showed that I gel takes a lesser amount of time for insertion as compared to the Baska which was statistically significant (P value of 0.001) and incidence of sore throat as a post-operative complication is found to be higher in the Baska group concluding that the I gel appears to be a better supraglottic airway device as compared to the Baska. **Shanmugavelu G et al** [(17)] in a study showed that insertion time was shorter for I-gel than Baska mask (P value of 0.124) which is statistically non-significant. Oropharyngeal leak pressure was significantly higher for Baska mask than I gel which was statistically significant (P value of 0.0008). Oropharyngeal airway morbidity was not significantly different between the two groups.

The Baska mask is a recently introduced device with unique improvements over other supraglottic airway devices to enhance patient safety and ease of insertion. The device has been stated to serve an additional advantage of higher sealing pressures compared with other non-inflatable devices such as I gel. As both Baska mask and I-Gel are uncuffed supraglottic airway devices we have compared them in our study in the following characteristics.

- Timetakentoinsertthedevice
- Airwaysealingpressure
- Rateofsuccessfulinsertionofdevice
- Numberofattempts
- Changesinhaemodynamics(HR,MAP)
- Laryngopharyngealmorbidity

TIMETAKENTOINSERTTHEDEVICE

In our study the **time taken to insert the device**, for Baska mask it was 18.9±4.1 seconds and for the I gel it was 17.2±5.1 seconds with a P value of 0.089 which was statistically insignificant.Inastudyby**AbdelRaofAbdelAzizetal**[(13)]wheretheutilityofI-Gelwith Baska Mask in obese patients undergoing elective ambulatory surgeries was compared, the time taken to insert Baska mask was 19.6 ± 8.4 seconds and I gel was 15.6±4.6 secondswithaPvalueof0.024whichwassignificant.Asamplesizeof30ineach group might be the cause for their significant difference in time taken for insertion of device. Our results are comparable with this study in terms of similar time taken for insertion.In a study by **Shanmugavelu G et al**[(17)]the mean insertion time of I-gelwas shorterwhencomparedtoBaskamask(12.3±3.8secVs20.1±8.1sec)withaPvalue of 0.124 which was statistically

insignificant similar to our results.Ourstudyresultsarealsoconsistentwiththeresultsof**Abita•ao• luetal**[16],SachidanandaRetal[1].

In a study by **Shivani Fotedar**[14] done in 2018 where I-Gel and the Baska mask werecompared,themeantimeforinsertioninIgelwas5secondsandforBaska mask was 23.0 seconds. This disparity might be because of author's attempt to secure baska mask in spontaneously ventilating anaesthetized patients.

AIRWAYSEALINGPRESSURE(ASP)

In our study, the mean airway sealing pressure of the Baska mask (26.1±6.1 cmH_2O)wassignificantlyhigherthanthatoftheI-gel (23.1± 5.9cmH_2O)withaPvalue of 0.019.**Abdel Raof Abdel Aziz et al** [13]in a study showed that mean airway sealing pressure was significantly higher in baska group (28.6±2.9 cm H_2O) than I gel group(23.6±3.07 cmH_2O)withaP valueof0.0008.Ourstudy resultsare comparabletothisstudy.**Shanmugavelu G et al** [17]in a study showed that mean airway pressure of baska mask (26±5.8cmH_2O)wassignificantlyhigherthanI-gelgroup(22±4.1cmH2O)withaP value of 0.0008. Our study results are comparable to this study.Our study findings are also consistent with findings observed by other authors **Shivani Fotedar** [14], **Chaudhary et al**[15], **Sachidananda R et al**[1].**Abita• ao• lu et al**[16] in their study showed that there was statistically no difference between Baska mask and I-gel in terms of airway sealing pressures(32± 2 Vs 30 ± 4 cmH2O);This study is the first study in the literature done in 2016-2017 to compare Baska mask and I-gel,lack of expertise and a low sample size of 15 patients in each group might be the cause for disparity in resultscompared to our study.The better maintenance of ASP with Baska mask is due to the cuff of the Baska mask, a recoilable membrane that inflates and deflates with the respiratory cycle, so the pressure on the surrounding tissues is never more than the peak airway pressure. This decreases the laryngopharyngeal morbidity and also increases the oropharyngeal sealwith IPPV(Intermittent positive Pressure Ventilation) [15]

RATEOFSUCCESSFULINSERTIONOFDEVICE

ThefirstinsertionattemptsuccessratewithBaskamaskandI-gelwere comparable in our study.In ourstudy,success rate ofbaska mask in the firstinsertion attemptwas 84.4% and second attempt success rate was 15.6%.In I-gel group, first insertion attempt success rate was 93.3% and second attemptsuccess rate was 6.7%. Overall success rate (in two attempts) was 100% in both Baska mask and I-gel group.

Inastudyby**SachidanandaRetal**[1]thefirst-timeinsertionsuccessrateof the Baska mask was 88% when compared with the I-gel, which was 92%. Our study results are comparable to this study.**Abdel Raof Abdel Aziz et al** [13] in their study results showed that first attempt success rate of insertion in I-gel group was 83.3% and Baska group was 90% with an overall success rate of 90% in I-gel group and 96.67% in Baska mask group. Probable cause for lower overall success rate in this study might be because of the study done in obese patients with BMI 25-40Kg/m^2 whereas our study excluded patients with BMI>30Kg/m^2.**Abita• ao• lu et al** [16] in a study, showed that success rate in the first insertion attempt was 40 %. Such a long insertion duration and a low ratio of success rate in thefirstattemptin their studywasattributedtothenecessity topositionthecuffopeningin the glottis due to the specific nature of Baska mask, leading to a potential insertion difficulty to a particular extent and also, the leaflet structure of non-inflating cuff of Baska Maskthatcancontacttoteethduringinsertionmightbecreatingdifficultyinthecourse oforal passage.This study is the first study in the literature done in 2016-2017 to compare Baska mask to I-gel, lack of expertise might also be the cause for low first attempt success rate.Studies[1,14,15,17] done later to **Abita• ao• lu et al**[16], showed higher first attempt success rates showing thatlack of expertise was the probable cause in their study for lower success rate.

In our study, both Baska mask and I-gel devices were inserted with high success ratesonthefirstattempt84.4%and93.3%respectivelyand100%overallsuccessrate in both group. This finding is in agreement with the results of**Shivani Fotedar**[14],**Chaudhary etal**[15],**Sachidananda R etal**[1],**Shanmugavelu Getal**[17].

LARYNGOPHARYNGEALMORBIDITY

Postoperativelaryngopharyngealmorbidityintheformofpostoperativesore throat, dysphagia and hoarseness of voice 1 hour and 24 hours post extubation is comparable between the two groups in our study.57.8% of patients in Baska group and 60% of patients in I-gel group had sorethroat after 1hour of extubation.6.7% and 11.1% of patients had sore throat after 24 hours of extubation in Baska and I- gel group

respectively.Postoperativecomplicationsarecomparablebetweentwogroupsinstudies doneby **AbdelRaofAbdelAziz etal**[13],**ShivaniFotedar**[14],**Chaudhary etal**[15], **Abita• ao• lu etal**[16],**Sachidananda Retal**[1],**Shanmugavelu Getal**[17]. Higher incidence in our study may be due to mean duration of surgeries being longer(89.9±20.7minutesinBaskagroup&88.2±17.8minutesinI-Gelgroup)than other studies discussed previously.

HAEMODYNAMICS

In our study mean heart rate (in beats per minute) at various time intervals of Baseline,1,5,10minutesafterintubationinBaskagroupwas80.5±17.4,85.9±17.7,83.6±17.1,

80.7±16.2respectively.In our study mean heart rate (in beats per minute) at various time intervals of Baseline,1,5,10minutesafterintubationinIgelgroupwas83.4±16.1,88.4±17.6,83.8±15.8,81.3±15.1respectively.Inourstudymeanarterialpressure(inmmHg)atvarioustimeintervalsof baseline,1,5,10minutesafterintubationinBaskagroupwas81.1±10.7,90.5±13.4,82±11.3,78.5±10.0respectively.Inourstudymeanarterialpressure(inmmHg)atvarioustimeintervalsof Baseline,1,5,10minutesafterintubationinIgelgroupwas79±8.6,86.8±12.3,78.7±9.6,75.2±8.2respectively.

There was no statistical difference between Baska mask and I-gel groups inregards to hemodynamic changes. This may be due to the same stress response produced by the both devices. These results are consistent with previous studies by **Sachidananda R et al**[1], **Shivani Fotedar**[14], **Abita• ao• lu et al**[16]

5. LIMITATIONS.

- OnlypatientswithMallampaticclassIandIIwereincludedinthestudy.
- Thesealingpressurewasmeasuredonlyonceafterplacementofthedevice.
- Bronchoscopywasnotperformedtoevaluatetheappropriateplacementofthe device as our study included only minor surgical procedures.

6. Conclusion:

Baska mask is superior to I-gel in positive pressure ventilation under general anaesthesia for short surgical procedureswith statistically significant higher airwaysealingpressurethoughithascomparabletimeofinsertion,haemodynamicchanges and laryngopharyngeal morbidity .

ACKNOWLEDGEMENTS

Nil

COMPETING INTERESTS

Nil

CONSENT (WHEREEVER APPLICABLE)

Informed written consent taken

ETHICAL APPROVAL (WHEREEVER APPLICABLE)

The patient and attendees were explained about the procedure and the expected complications. They were informed about the present study and their eligibility for participating in the study. Only patients who were willing to participate were included and informed consent was obtained. The study was approved by the Institutional Ethical Committee [NBE/CNS/DNB PDCET/41159]

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

REFERENCES

1. SachidanandaR,ShaikhSI,MitragotriMV,JoshiV,LadhadDA,MallappaM, Bhat VK. Comparison between the Baska Mask® and I-Gel for Minor Surgical Procedures Under General Anaesthesia. Turkish Journal of Anesthesia& Reanimation. 2019 Jan 1;47(1).
2. Almeida G,Costa AC,Machado HS.Supraglottic airway devices:a review in a new era of airway management. J Anesth Clin Res. 2016;7(647):2.
3. Miller DM. A proposed classification and scoring system for supraglottic sealing airways: a brief review. Anesthesia& Analgesia. 2004 Nov1;99(5):1553-9.
4. Levitan RM, Kinkle WC. Initial anatomic investigations of the I-gel airway: a novel supraglottic airway withoutinflatable cuff.Anaesthesia.2005 Oct;60(10):1022-6.
5. van Zundert T, Gatt S. The Baska Mask®-A new concept in Self-sealingmembranecuffextraglotticairwaydevices,usingasumpandtwogastricdrains: AcriticalevaluationJournalofObstetricAnaesthesiaandCriticalCare.2012 Jan 1;2(1):23.
6. Alexiev V, Salim A, Kevin LG, Laffey JG. An observational study of the Baska® mask: a novel supraglottic airway. Anaesthesia. 2012 Jun;67(6):640-5.
7. MillerRD. Miller's Anesthesia. 8th ed. Elsevier Saunders. Chapter 55.Philadelphia: Churchill Livingstone-Elsevier; pp. 1648-1651
8. Hagberg CA, Artime CA. Airway Management in the Adult. In: Miller RD, editors. Miller's Anesthesia. 8th ed. Philadelphia: Saunders; 2015. p. 1661.
9. Cook T, Howes B. Supraglottic airway devices: Recent advances. Contin EducAnaesth Crit Care Pain. 2011;11:56–61.
10. Kannaujia A, Srivastava U, Saraswat N, Mishra A, Kumar A, Saxena S. A preliminary study of i-gel: a new supraglottic airway device. Indian journal of anaesthesia. 2009 Feb;53(1):52.
11. I-gel for use in anaesthesia [Internet]. Berkshire; Intersurgical Ltd:2018. Available from: https://www.intersurgical.com/info/igel-anaesthesia
12. Cook T. Airway management equipment. In: Davey A, Diba A, Ward C, editors. Ward's anaesthetic equipment.6th ed. Edinburgh:Elsevier;2012.p. 156.
13. Aziz RA, Osman YM. Comparison of I-gel with Baska Mask Airway for Controlled Ventilation in Obese Patients Undergoing Ambulatory Surgery: A Prospective RandomizedTrial.InternationalJournalofAnesthesiaandClinicalMedicine. 2017 Nov 20;5(4):29.
14. Fotedar S, Taneja D, Sarangi S. INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH. Age.;38(36.85):0-528.
15. Chaudhary UK, Mahajan SR, Mahajan M, Sharma C, Sharma M. A comparative analysisofthebaskamaskversusI-gelforgeneralanesthesiainsurgical patients undergoing laparoscopic cholecystectomy. Acta Medica International.2018 Jul 1;5(2):69.
16. AbitağaoğluS,KöksalC,TuranG,AkgünAY,ArıDE.Comparisonoftheclinical performancesofi-gelandbaskamask.MedicalScience.2019;23(95):100-7.
17. Shanmugavelu G, Kanagarajan T. Comparing the functional analysis of I-gel with Baskamaskinlaparascopicsurgeries:Anobservationalstudy.IntJResMed Sci. 2018;6:1440-3.
18. Al-RawahiSA,AzizH,MalikAM,KhanRM,KaulN.Acomparativeanalysisof the Baska mask vs Proseal laryngeal mask for general anesthesia with IPPV. Anaesth Pain & Intensive Care. 2013 Sep 1;17(3):233-6.
19. López AM, Muñoz-Rojas G, Fontanals M, de San José I, Hermoso A, Valero R. Clinical evaluation of the Baska Mask® laryngeal mask in adult patients in ambulatory surgery. Revista Española de Anestesiología y Reanimación (English Edition). 2015 Dec 1;62(10):551-6.
20. Jawe N, Dhumal P, Rathi P, Padmanabha DV, Kumbhar A. Comparative study of clinical performanceofI-Gel withclassicLMA inadultpatients.Journal of Evolution of Medical and Dental Sciences. 2016 Oct 13;5(82):6121-5.
21. Beleña JM, Núñez M, Vidal A, Gasco C, Yuste J, Kahn A. Comparison of the i- gelTM and the LMA ProsealTM in anesthetized patients undergoing laparoscopic cholecystectomy: a prospective, randomized clinical trial. Anaesthesia, Pain & Intensive Care. 2019 Jan 26:135-40

22. LaiCJ,LiuCM,WuCY,TsaiFF,TsengPH,FanSZ.I-Gelisasuitable alternative to endotracheal tubes in the laparoscopic pneumoperitoneum and trendelenburg position. BMC anesthesiology. 2017 Dec;17(1):3.
23. Dhanda A, Singh S, Bhalotra AR, Chavali S. Clinical comparison of I-gel supraglottic airway device and cuffed endotracheal tube for pressure-controlled ventilation during routine surgical procedures. Turkish journal of anaesthesiology and reanimation. 2017 Oct;45(5):270.
24. De Montblanc J, Ruscio L, Mazoit JX, Benhamou D. A systematic review and meta-analysisofthei-gel®vslaryngealmaskairwayinadults.Anaesthesia. 2014 Oct;69(10):1151-62
25. Kumar Sinasamy T, Nazaruddin Wan Hassan Wm, Hardy Mohamad Zaini R, Seevaunnamtum P, Ab Mukmin L. Comparison Of The Baska Mask And The I-Gel Supraglottic Airway Devices In Patients Undergoing Elective Surgery. Anaesthesiol Intensive Ther. 2020;52(5):383-388. Doi: 10.5114/Ait.2020.101407. Pmid: 33327696; Pmcid: Pmc10183981.
26. Sharma, Parul1; Rai, Sujeet1,; Tripathi, Manoj1; Malviya, Deepak1; Kumari, Sumita2; Mishra, Smarika1. Comparison of LMA Supreme, i-gel, and Baska Mask for Airway Management during Laparoscopic Cholecystectomy: A Prospective Randomized Comparative Study from North India. Anesthesia: Essays and Researches 16(1):p 42-48, Jan–Mar 2022. | DOI: 10.4103/aer.aer_23_22
27. MEENA, S., N. SHARMA, J. S. MEENA, and K. K. MALAV. “COMPARISON BETWEEN BASKA MASK AND I-Gel INSERTION IN MINOR SURGERIESUNDER GENERAL ANAESTHESIA IN PATIENT AGED 18-50 Y:-A RANDOMIZEDINTERVENTIONAL STUDY”. *International Journal of Current Pharmaceutical Research*, vol. 15, no. 4, July 2023, pp. 53-56, doi:10.22159/ijcpr.2023v15i4.3025.
28. Ramya, Bhimala Naga; Dav, Sandeep Kumar; Segaran, Sivakumar; Sivaramakrishnan, D.1; Zachariah, Mamie; Ranjan, R. V.2. Comparison Of I-Gel™ Versus Baska Mask® On Oropharyngeal Sealing Pressure In Patients Receiving General Anesthesia Under Spontaneous Ventilation: A Randomized Controlled Trial. Journal Of Current Research In Scientific Medicine 9(1):P 36-41, Jan–Jun 2023. | Doi: 10.4103/Jcrsm.Jcrsm_84_22
29. Agarwal N, Singh Gp, Saigal D. Comparison Of Baska Mask With I-Gel As Ventilatory Device In Adult Patients Undergoing Laparoscopic Cholecystectomy. Panacea J Med Sci 2021;11(3):477-483