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THE RELATIONSHIP OF BODY MASS INDEX AND LENGTH OF SURGERY WITH INCIDENT SHIVERING ON PATIENT SPINAL ANESTHESIA

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Abstract
Spinal anesthesia is a type of anesthesia that is injected into the cerebrospinal tract fluid (CSF) when a patient is undergoing surgery. Spinal anesthesia causes hypothermia which triggers shivering. Shivering is the body's attempt to increase heat production and increase body temperature . Objective : To determine the relationship between body mass index and duration of surgery with the incidence of shivering in spinal anesthesia patients. Method: Correlation research with a cross sectional approach. The research sample composed of 73 respondents using accidental sampling data collection techniques. This research uses the Chi-Square test, point biserial test and logistic regression test as statistical analysis tests.Results : Statistical test results showed that there was a significant relationship between body mass index and the incidence of post anesthesia shivering. Conclusion: There is a relationship between body mass index and the incidence of post anesthesia.
Keywords : Post Spinal Anesthesia Patients, Shivering Factor, Post AnesthesiaShivering

INTRODUCTION

Post Anesthesia Shivering is response physiological to exposure cold and way body maintain hot after vasoconstriction peripheral (Park, SM, Mangat, HS, Berger, K., & Rosengart, 2012) . *Shivering* is effort body For increase production hot and increase temperature body and maybe related with intense vasoconstriction (Pearl, 2013) . According to (Luggya, TS, Kabuye, RN, Mijumbi, C., Tindimwebwa, JB, & Kintu, 2016) hypothermia is factor main reason happen *shivering* . *Spinal anesthesia* cause shivering Because vasodilation , which facilitates disappearance hot in a way fast and causing redistribution hot body from core to network peripheral , so result hypothermia and shivering (Amsalu, H., Zemedkun, A., Regasa, T., & Adamu, 2022) .

Prevalence post *shivering* operation reported in various study around 40%-70% (Gholinataj, A., Baradari, AG, Najafi, S., & Kiabi, 2021) . Incidence rate *shivering* occurs after done *spinal anesthesia* range 30%-33% (Lopez, 2018) . Number *incidentPost Anesthetic Shivering* (PAS) on patient Which undergo *spinal anesthesia* around33-56.7% (Mashitoh, D., Mendri, NK, & Majid, 2018) .

Bangil Regional General Hospital (RSUD). is House existing pain in the Regency Pasuruan . Based on interview with one nurse in Bangil Hospital *recovery room* obtained description incident *shivering* in patientspost *spinal anesthesia* No noted , but in a day incident *shivering* around 56patient from 10-12 patient Which It means around 50% patient experience *shivering* onpatient *spinal anesthesia* in a day .

Incident post *shivering* anesthesia or *Post Anesthetic Shivering* (PAS) on patient with *spinal anesthesia* Can happen Because a number of factor among them type operation , dosage anesthesia , temperature room , type fluid (Amsalu, H., Zemedkun, A., Regasa, T., & Adamu, 2022) . According to (Rothrock, 2018) factor risk happen *shivering* ie age , comorbidities , duration of operation , BMI, and type fluid . Apart from that, pre-operative temperature also has an effect against *shivering.* According to (Rauch, S., Miller, C., Bräuer, A., Wallner, B., Bock, M., & Paal, 2021) patients with core temperature low before arrive in room operation risky more tall experience hypothermia oreven *shivering* on intra And post operation. Factor risk other Which causeThe occurrence of *shivering* is age, low body mass index, and diseases such as neuropathy diabetes, paraplegia, or hypothyroidism heavy.

His research is entitled Comparison Incidence of Postoperative *Shivering with General Anesthesia and Spinal Anesthesia in* Abdul Wahab Sjahranie Hospital Samarinda stated that the number of incidents *shivering* in HOSPITAL Abdul Wow Sjahranie Samarinda on spinal anesthesia Enoughhigh as evidenced by the results of the research, namely the incidence of post *shivering* operation with technique anesthesia spinal is as big as 47.62% (10 from 21 patient) Andincident *shivering* post operation with technique anesthesia general is as big as 33.34% (16 from 48 patients) (Hidayah, ES, Khalidi, MR, & Nugroho, 2021)

According to study (Hi Gani., 2022) , based on index mass body incident *shivering* obtained results 4 person (8%) experience *shivering* 1st degree, 2 person (4%) experience *shivering* degrees 3, And 28 person (56%) experience *shivering* grade 4. This is in line with research (Andri, S., Sri, H., & Jenita, 2017) as 21 of 40 patients experienced *shivering* with a BMI <18.5 and 19 of 40 patients experiencing *shivering* with a BMI > 18.5. Based on research (Hati, 2021) there is connection between type sex, BMI, long operation, type operation, And room temperature with *Post Anesthetic Shivering* (PAS). There is no meaningful relationshipbetween age with Post Anesthetic *Shivering* (PAS).

Post Anesthesia Shivering (PAS) causes consumption oxygen body increase , factor freezing blood disturbed , pressure intracranial And intraocularincrease . *Post Anesthesia Shivering* also causes production carbon dioxide increase , saturation oxygen decline , healing wound disturbed , cotecholamine increase , And frequency Also increase . *Shivering* Which Enough long Also cause ischemic muscle heart (Li, M., Hu, X., Tan, Y., Yang, B., Li, K., & Tang, 2016) . According to (Pearl, 2013) post *shivering* operation can increase consumption oxygen five times fold , can lower saturation oxygen arteries , And can linked with enhancement risk ischemia myocardium . Based on the above phenomenon so important done study about connection index period body with incident *shivering* on patient post *spinal anesthesia* in room *recovery rooms* HOSPITAL Bangil

RESEARCH METHODS

Study This use study survey analytic that is something studywho digs how and why phenomenon health That happen with approach *cross sectional.* Approach *cross sectional* that is study Forlearn dynamics correlation between factors risk with effect , with methodapproach ,

observation or collecting data at once at a time moment (*point timeapproach*) (Notoatmodjo, 2018) . Study This use study survey analytics , because study This analyze correlation between type sex , age ,type surgery , duration of surgery , ASA physical status , body mass index , temperature environment , temperature body preoperative , and comorbid with incident *post anesthesiashivering.* So, in study This researcher use design studysurvey anlitic with approach *cross sectional.* Population study This is all over patient performedaction spinal anesthesia in HOSPITAL Bangil on date April 10-30 2023Retrieval techniques sample used in study This is non probability sampling in the form of *accidental sampling* , ie with take case or respondents Which as it happens There is or available in somethingplace in accordance with context study (Notoatmodjo, 2018) . Researcher do observation of patients post *spinal anesthesia* with amount sample 73 person and take notes whether there is / isn't there incident *shivering* Criteria inclusion from study This are : Patients Which willing become Patient respondents post-operative with spinal anesthesia Criteria exclusion from study This is a patient Which Not yet agree *informed consent*

Type of data used in study This divided into two types , ie data secondary And data primary. Data secondary obtained researcher in a way Nodirect through media intermediary ie record medical patient post spinal possible anesthesia support study . Record data medical needs that is type leamin , age , type surgery , duration of surgery , ASA physical status , mass index body , temperature environment , temperature body preoperative and comorbid . Primary data on study This is the data obtained direct from data source . Primary data patient obtained with researcher do observation on patient post-operativewith spinal anesthesia and take notes whether there is / isn't there incident *shivering.*

Variable on study This that is index body mass , Variable bound in study This that is variable Which influencedby variables free that is *post anesthesia shivering*

Instrument study is the tools used For data collection (Notoatmodjo, 2018) . Instrument Which required in study is sheetobservation For document data results observation For see whether there is / isn't there incident *shivering.* Researcher observe temperature environment patient where is Bangil Regional Hospital? Room operation there are 5 and every room own temperature environment different ones that have been arranged by the Hospital . Other instruments that needed in study This book Record Medical patient For complete the data secondary form type gender , age , gender surgery , duration of surgery , BMI, temperature body pre surgery and comorbidities

Univariate analysis is a type of analysis that involves only one variable (Lusiana, ED, & Mahmudi, 2020) . In this study, we analyzed the frequency distributionrespondents based on gender, age, type of surgery, duration of surgery, ASA status, comorbidities, fluid type, preoperative body temperature and environmental temperature. Results data analysis will served in form table distribution frequency And percentage .

Analysis bivariate in study This used For know connection between variables in the research , namely connection mass index body with incident *post anesthesia shivering* .

RESEARCH RESULTS AND DISCUSSION

Characteristics Respondent

The results of data collection regarding characteristics respondents study served in table 1

Table 1 Distribution frequency characteristics patient post *spinal anesthesia* in HOSPITAL Bangil on the month April 10-30 2023

Variable	*f*	Percentage (%)
Type sex		
- Laki-laki	34	46,6
- Perempuan	39	53,4
Total	73	100
Usia		
- Remaja akhir 17-25	6	8,2
- Dewasa awal 26-35	24	32,9
- Dewasa 36-45	21	28,8
- Lansia awal 46-55	6	8,2
- Lansia akhir 56-66	16	21,9
Total	73	100,0
Jenis pembedahan		
- Laparatomi	38	52,1
- Non laparatomi	35	47,9
Total	73	100,0
Lama pembedahan		
- Cepat : <1 jam	23	31,5
- Sedang : 1 -2 jam	40	54,8
- Lama : > 2 jam	10	13,7
Total	73	100
Status ASA		
- ASA 1	42	57,5
- ASA 2	22	30,1
- ASA 3	9	12,3
Total	73	100,0
Indeks masa tubuh		
- Underweight	10	13,7
- Berat Badan Normal	42	57,5
- Overweight	21	28,8
Total	73	100
Suhu lingkungan		
- $<20^0$	53	72,6
- 21^0-24^0	20	27,4
Total	73	100
Suhu tubuh pre operasi		
- Hipotermi <36	12	16,4
- Normal 35-37.2	61	83,6
Total	73	100
Komorbid		
- Ada riwayat peyakit	15	20,5
- Tidak ada riwayat penyakit	58	79,5
Total	73	100

Table 1 shows characteristics respondents based on type sex , age , type surgery , duration of surgery , ASA status, body mass index , temperature environment , temperature preoperative body , comorbidities , and events *post anesthesia shivering*on sample Which

amount 73 person in HOSPITAL Bangil . Type sex patient partbig is Woman as much 39 person (53.4%). Group age almost half are of age mature early (46-65 years) as many as 24 people (32.9%).Type of surgery almost half done that is type surgery medium 38 people (32.1%). The length of surgery performed is mostly in the category laparotomy, namely 38 people (52.1%). ASA status is mostly in categories ASA 2, namely 42 people (57.5%). Body mass index is mostly low in the normal weight category, namely 42 people (57.5%). Ambient temperature When patients undergo surgery, most of them are at a temperature <20 ^{o} C, which is as much as 53 patients (72.6%). Almost all preoperative body temperatures are within the temperature range normal that is as much 61 person (83.6%). Incident *shivering* on patient Which use *spinal anesthesia* as many as 41 respondents (56.2 %).

Connection Index Period Body with Incident *Shivering* on Patient Post *Spinal Anesthesia* a in HOSPITAL Bangil 10-30 April 2023

Connection index period body with incident *post anesthesia shivering* onpatient post *spinal anesthesia* explained on table as following This .

Table 2 connection index period body with incident *post anesthesia shivering* onpatient post *spinal anesthesia* at the hospital Bangil Month 10-30 April 2023

Event Variables -	***shivering***				**Total *P***		***value***
	Ya	**Persentase (%)**	**Tidak**	**Persentase (%)**	**N**	**Persentase (%)**	***(pearson chi-square)***
Underweigh	10	13,7	0	0	10	13,7	0,000
Berat badan normal	28	38,4	14	19,2	42	57,5	
overweight	3	4,1	18	24,7	21	28,8	
Jumlah	41	56,2	32	43,8	73	100	

Based on table 2 can is known that index period body on patientpost *spinal anesthesia* a almost half happen on category BMI with heavybody normal that is as many as 28 people (38.4%).

Calculation results *chi square* above can is known that significance *p-value* of 0,000 . Therefore table cross (*cross tabulation*) 3x2, then usemark *Pearson Chi-square.* On mark *Pearson chi-square* as big as 0.000<0.005 soH_1 accepted which means There is connection between body mass index with incident *post anesthesia shivering* with correlation 0.574.

Connection Index Period Body with Incident *Shivering* on PatientPost *Spinal Anaesthesia* at the hospital Bangil 10-30 April

Based on table 2 can is known that patient incident post *shivering spinal anesthesia* a almost half occurs in patients with body mass index normal , namely 28 people (38.4%). Chi

Square test results were obtained p- value of 0,000 so Ho rejected It means There is connection Which significant between Index Mass Body with incident *shivering* in spinal patients anesthesia .

According to (Kartasapoetra & Marsetyo , 2008) fat is source from shaper energy in body , where the energy produced from each the gram more big from carbohydrates and proteins. Fat works too as shaper arrangement body , protector lost hot body And regulator temperature body . Person Which ownLow BMI that is has thin and easy fat lost hot Because internal fat stores body A little so that matter the can trigger incident *shivering* in patients with spinal anesthesia . According to research conducted by (Yuda, 2021) through the *chi square* test was obtained significant relationship between index body mass with incident *shivering* with majority respondents who experienced *shivering* ie as many as 33 respondents with percentage 55%. This matter in line with study Which done by (Andri, S., Sri, H., & Jenita, 2017) in study Which title " *TheCorrelation Of Body Mass Index With Shivering Of Spinal Anesthesic Patients in* Hospital PKU Muhammadiyah Yogyakarta" state that based on data Which obtained , respondents Which own index mass body low more risky experience decline temperature body during operation Which can trigger incident *shivering* .

Results analyst in a way whole factor BMI on study This that is There is connection between BMI and incident *shivering.* With body mass index well , then fat which in in the body cause lost hot more A little than BMI low . So , researchers conclude that body mass index compare straight with temperature body , when mark index mass body big results temperature Which obtained Alsothe more big so that incident *shivering* Also the more small . Whereas , patientwith a low BMI tend more fast lost hot the body that causes it body tend more easy experience hypothermia perioperative Which trigger happen*shivering.*

CONCLUSION

From results study Which done about Connection body mass index and duration of surgery with incident shivering on patient spinal anesthesia can concluded There is connection between index period body with incident *post anesthesia shivering* on patient post *spinal anesthesia* a

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