



RESEARCH ARTICLE

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The Analgesic Efficacy of Suprascapular Nerve Block During and after laproscopic Cholecystectomy under Spinal Anesthesia

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Abstract

Background: Supra-scapular nerve block (SSNB) is a safe and effective method to treat pain in chronic diseases. The suprascapular nerve is a mixed motor and sensory peripheral nerve arising from the superior trunk of the brachial plexus. The nerve supplies motor innervation to shoulder muscles and sends sensory branches to multiple places in the shoulder region. A shoulder block without lung affection is desirable. We study The Analgesic Efficacy of suprascapular nerve block during and after laparoscopic cholecystectomy under spinal Anesthesia. We hypothesized that local anesthetic would provide non-inferior block success rate with better preserved lung function. Suprascapular nerve block reduced the odds of postoperative nausea and vomiting and improved patient satisfaction.

Aims: To evaluate the analgesic efficacy of right suprascapular nerve block during and after laparoscopic cholecystectomy done under spinal anesthesia during surgery and over the first postoperative 12 hours. Subjects and methods: An interventional trial done for Consecutive newly diagnosed cases of cholelithiasis who reported to the Department for surgery and who met specific criteria of American Society of Anaesthesiologist's ASA grade I and II, of age between 30 and 60 years of age. Exclusion criteria implemented on large number of patients, the study extended over the past three years in AlJumhori hospital. Data analysis was done by SPSS (V-26), where P value <0.05 consider significant.

Results: A Thirty cases underwent Interventional trials subdivided systemically in to two groups, where there was no significant statistical difference according to their sex when crossly matched with the type of intervention also there was no significant statistical difference regarding the mean of their age. Severity of pain had a statistical difference when compared according to type of interventional Trials at 3 different situations of comparison during the intra-operative assessment and post-operative assessment at 6 hours and 12 hours all of p values where less than 0.05. All of pairs regarding the comparison of pre and intra operative assessment regarding pulse rate, systolic blood pressure and diastolic blood pressure show significant statistical difference when assessed by t-test the first pair show strong positive correlation while the second one show weak positive correlation finally the third one show equivocal correlation.

Conclusion: Analgesic Efficacy of Suprascapular Nerve Block During and after laproscopic Cholecystectomy under Spinal Anesthesia was an efficacious, safe, potent type of intervention in both occasion

Key word: Efficacy, Suprascapular Nerve Block, laproscopic Cholecystectomy, Spinal Anesthesia, Basrah

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1 | INTRODUCTION

Laparoscopic cholecystectomy is classically performed under general anesthesia; there are only sporadic references in the literature about regional anesthesia being used in special cases a high risk to undergo general anesthesia. [1, 2] Laparoscopic cholecystectomy done under spinal anesthesia may have several advantages over laparoscopic surgery done under general anesthesia. [3] Many researchers have observed that performing laparoscopic surgery under regional anaesthesia carries many advantages. The reduction of surgical stress response is considered one of its major advantages. This is accomplished through out two aspects, laparoscopic technique, itself which reduce the degree of tissue trauma and consequently the injury response (minimal invasive surgery concept), and spinal analgesia itself which provides pain relief by blocking afferent neural block together with block of various humoral mediator cascade system. [4-6]

The presence of adequate levels of analgesia for the first few hours after the completion of surgical procedure owing to existing activity of analgesia injected in the subarachnoid space. [7] Avoidance of air way instrumentation and lower incidence of deep vein thrombosis are other important advantages of this technique. These advantages, however, were counteracted by some reported disadvantages like, limited, work space, high failure rate, more intra operative morbidity and significant blood gas alterations. In order to avoid these disadvantages, we modified the surgical technique, and a more effective sedation technique was used throughout the whole procedure .The intra-abdominal insufflations pressure was limited to 10mmHg with a low insufflations flow technique (1.5L/min) thus contributing to reduction of intra operative hemodynamic alteration. Another problem is the possibility of inadequate ventilation due to extensive thoracic nerves block. The main respiratory muscle, diaphragm, will be unaffected because it is innervated from cervical level, and expiration is normally a passive phenomenon. However, forceful

expiration and coughing will be affected because they are generated primarily by the muscles - of the anterior abdominal wall which are innervated by- the thoracic nerve. [7, 8].

Use of inadequate dose of local anesthetics, can produce disastrous effects in patients with obstructive - airway disease which depends on active expiration in - maintaining lung ventilation. Thus, the degree of nerve block - and muscle weakness should be minimized by using adequate - dose of local anesthetics. Another concern is careful control of the pneumo-peritoneal pressure during surgery to ensure adequate diaphragmatic excursion. Because pneumo-peritoneum by CO₂ insufflations can stimulate vagal nerve and cause bradycardia, CO₂ must be insufflate slowly, and the low intra-abdominal pressure. Pressure was maintained around 10 mmHg. The use of low pressure pneumoperitoneum did not jeopardize the adequacy of surgical space and subsequently the view and the procedure was completed without any technical difficulty. Spinal anesthesia offers sensory, motor and sympathetic block at the high level and obviates the need for abdominal muscle relaxants. It seems regional anesthesia may be alternative method to general anaesthesia for laparoscopic cholecystectomy. Other methods such as thoracic spinal, thoracic epidural combined thoracic spinal & epidural, etc. could be performed. However, more cases should be performed in order to prove its safety.

2 | SUBJECTS AND METHODS

An interventional trial done for Consecutive newly diagnosed cases of cholelithiasis who reported to the Department for surgery and who met specific criteria of American Society of anesthesiologists' ASA grade I and II, of age between 30 and 60 years of age. Exclusion criteria implemented on large number of patients, the study extended all-over the past three years in Al-Jumhori hospital. Data analysis was done by SPSS (V-26), where P value <0.05 consider significant. Consecutive newly diagnosed cases of

cholelithiasis who reported to the Department for surgery and who met the following criteria were enrolled in the study:

- I. American Society of anesthesiologist's (ASA) physical status I, II Age between 30 and 60 years of age.

Exclusion criteria

- Failure to obtain consent
- Failure of spinal anesthesia

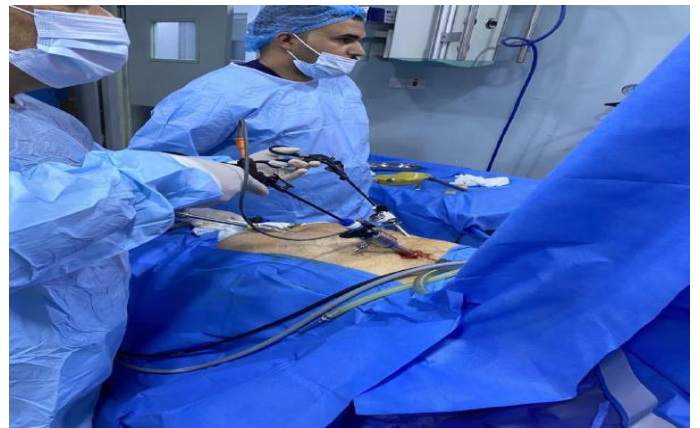
Patients with endocrine, renal, hepatic, or immunological disease and pregnant patients

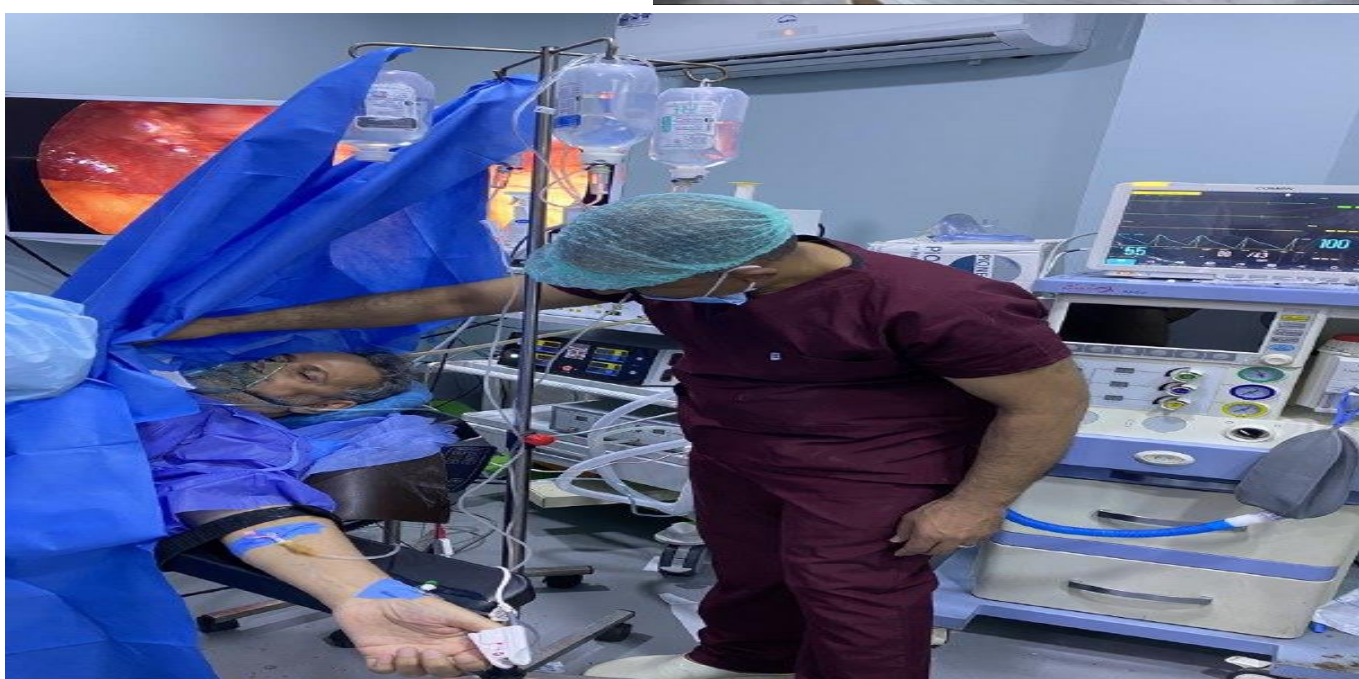
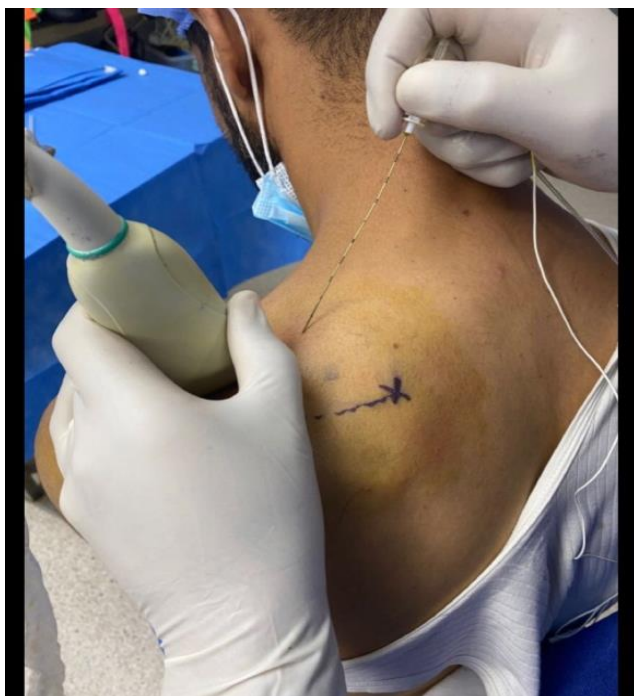
ASA grade III or IV Exclusion criteria were as follows:

- i. Acute Inflammatory process (cholecystitis, pancreatitis or cholangitis)
- ii. Suspected/confirmed common bile duct stones
- iii. Anxiety prone patient/diagnosed psychological morbidity
- iv. Bleeding diathesis
- v. Local spinal deformity which precluded safe spinal anesthesia Bleeding diathesis
- vi. Local spinal deformity which precluded safe spinal anesthesia

Procedure:

The preoperative assessment was done to all patients which included history, physical examination, and the routine investigations (CBC, ECG, liver function tests, renal function tests and coagulation profile). A standardized anesthetic management was performed similarly for all patients. Patients fasted for 8 h preoperatively. In the preoperative holding area on the morning of surgery, I.V cannula was inserted in patients' non-dominant hand and then premedicated by I.V midazolam (1–2 mg) and received prophylactic antibiotic before surgery. In the operating room, the standard monitors were attached to patients which included pulse oximetry, five leads ECG, noninvasive arterial blood pressure and capnogram. After preoxygenation, anesthesia was induced.







U/S guided with Insulating needle data were recorded by anesthesiologists who didn't participate in this study: The total analgesic requirements in the first 24 h postoperatively. Patients were instructed during the preoperative evaluation about the 100 mm Visual Analogue Scale score (VAS); in which 0 indicated no pain and 100 indicated the worst pain imaginable.

Statistical analysis: Sample size was calculated based on first analgesic request from a pilot study. Assuming an $\alpha = 0.05$ and a power of 80%, it yielded a sample size of 30 patients (15) per group using a two-tailed test. Data were collected and entered to the Statistical Package for Social Science (IBM SPSS) version 26. Shapiro-Wilk test was used to determine the normal distribution of our data. The parametric data in this study as time before the first analgesic request, demographic data, surgical data and hemodynamic parameters were all expressed as mean \pm standard deviation while the total analgesic requirement was expressed as [median (range)] and all compared by using the t-test. The nonparametric data was the VAS scores in both groups at the different intervals and were expressed as median, minimum, and maximum (min-max) and compared by using the Mann-Whitney test. P value less than 0.05 was considered statistically significant.

3 | RESULTS

A Thirty cases underwent Interventional trials subdivided systemically in to two groups, where there was no significant statistical difference

according to their sex when crossly matched with the type of intervention also there was no significant statistical difference regarding the mean of their age where p value was less than 0.05

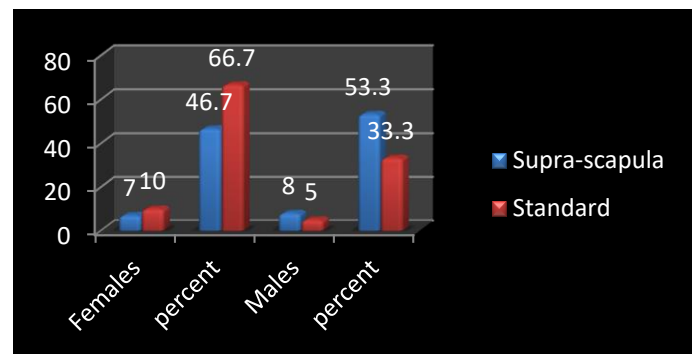


Figure one distribution of the sex according to the type of intervention Chi-square = 1.223, p value = 0.269

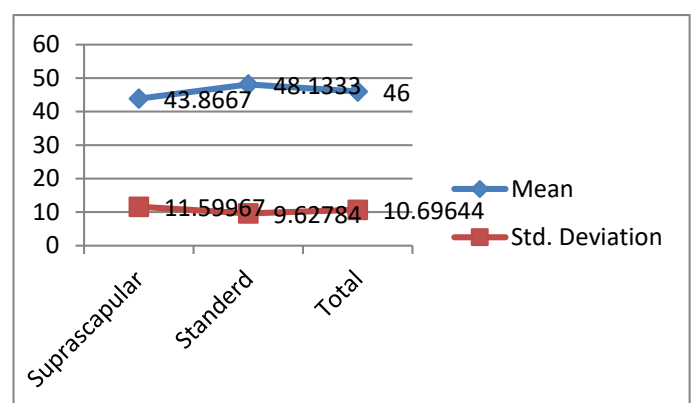


Figure one distribution of the age according to the type of intervention ANOVA- 1.021. P value=0.209

TABLE 1: SEVERITY OF PAIN ACCORDING TYPE OF INTERVENTION AND TIME OF ASSESSMENT

		Type		Total	Fisher Exact test, P value
		Supra-scapular	Standard		
Intra Operative Pain	Mild pain	3	3	6	11.424 0.002
		20.0%	20.0%	20.0%	
	Moderate	0	4	4	
		0.0%	26.7%	13.3%	
	No	12	4	16	
80.0%		26.7%	53.3%		
Severe	0	4	4		
		0.0%	26.7%	13.3%	
Post- Operative Pain after 6hours	Mild	0	8	8	17.368 ^a 0.001
		0.0%	53.3%	26.7%	
	Moderate	0	3	3	
		0.0%	20.0%	10.0%	
	No	15	4	19	
100.0%		26.7%	63.3%		
Post- Operative Pain after 12 hours	Mild	0	8	8	10.909 ^a .001
		0.0%	53.3%	26.7%	
	No	15	7	22	
		100.0%	46.7%	73.3%	
Total	Count	15	15	30	
	% within type	100.0%	100.0%	100.0%	

Severity of pain had a statistical difference when compared according to type of interventional Trials at 3 different situations of comparison during the intra-operative assessment and post-operative assessment at 6 hours and 12 hours all of p values where less than 0.05.

TABLE 2: DISTRIBUTION OF SOME VITAL SIGNS ACCORDING TYPE OF INTERVENTION

		N	Mean	Std. Deviation	ANOVA	P value
Converted	Supra-scapular	15	.0000	.00000	3.500	.072
	Standard	15	.2000	.41404		
	Total	30	.1000	.30513		
Intra operative Pulse Rate	Supra-scapular	15	105.2667	30.28783	2.868	.101
	Standard	15	91.3333	9.90430		
	Total	30	98.3000	23.24702		
Intra-op Systolic blood pressure	Supra-scapular	15	121.5333	17.22070	.189	.667
	Standard	15	118.8000	17.18887		
	Total	30	120.1667	16.96260		
Intra- op diastolic blood pressure	Supra-scapular	15	68.6000	13.91197	.029	.866
	Standard	15	69.4667	13.87632		
	Total	30	69.0333	13.65961		
Pre-op pulse rate	Supra-scapular	15	92.1333	21.71855	.512	.480
	Standard	15	87.3333	14.25115		
	Total	30	89.7333	18.21317		
Pre op Systolic blood pressure	Supra-scapular	15	144.6000	22.40153	8.294	.008
	Standard	15	125.3333	13.02013		
	Total	30	134.9667	20.49640		

Pre op diastolic blood pressure	Supra-scapular	15	87.3333	10.15358	5.298	.029
	Standard	15	79.3333	8.83715		
	Total	30	83.3333	10.19917		

The means of another parameters that including the systolic blood pressure, diastolic blood pressure pulse rate during the intra-operative assessment carrying no significant statistical difference women within the two types of interventions while preoperative systolic and diastolic blood pressure show significant difference p-value you was 0.008 and 0.029.

TABLE 3.1: DISTRIBUTION OF BLOOD PRESSURE AND PULSE RATE PRE AND INTRA-OPERATIVE AMONG WHOLE SAMPLE

		Mean	Std. Deviation	Paired t	Sig. (2-tailed)	Correlation	Sig.
Pair 1	PrePR - intraPR	-8.56667-	17.22805	-2.724-	.011	.679	.000
Pair 2	PreSBP - itraSBP	14.80000	21.73413	3.730	.001	.339	.067
Pair 3	PreDBP - intraDBP	14.30000	16.35205	4.790	.000	.083	.662

All of pairs regarding the comparison of pre and intra operative assessment regarding pulse rate, systolic blood pressure and diastolic blood pressure show significant statistical difference when assessed by t-test the first pair show strong positive correlation while the second one show weak positive correlation finally the third one show equivocal correlation.

TABLE 3.2: DISTRIBUTION OF BLOOD PRESSURE AND PULSE RATE PRE AND INTRA-OPERATIVE AMONG PATIENT UNDERWENT SUPRA-SCAPULAR NERVE BLOCK

		Mean	Std. Deviation	Paired t	Sig. (2-tailed)	Correlation	Sig.
Pair 1	PrePR - intraPR	-13.13333-	19.58814	-2.597-	.021	.764	.001
Pair 2	PreSBP - itraSBP	23.06667	25.20053	3.545	.003	.212	.449
Pair 3	PreDBP - intraDBP	18.73333	17.77826	4.081	.001	-.069-	.808

all of pairs regarding the comparison of pre and intra operative assessment regarding pulse rate, systolic blood pressure and diastolic blood pressure show significant statistical difference when assessed by t-test the first pair show equivocal correlation while the second one show weak positive correlation finally the third one show strong positive correlation

TABLE 3.3: DISTRIBUTION OF BLOOD PRESSURE AND PULSE RATE PRE AND INTRA-OPERATIVE AMONG PATIENT UNDERWENT STANDARD INTERVENTION

		Mean	Std. Deviation	Paired t	Sig. (2-tailed)	Correlation	Sig.
Pair 1	PrePR - intraPR	-4.00000-	13.65388	-1.135-	.276	.407	.133
Pair 2	PreSBP - itraSBP	6.53333	14.03499	1.803	.093	.599	.018
Pair 3	PreDBP - intraDBP	9.86667	13.98911	2.732	.016	.306	.268

Only diastolic blood pressure show significant statistical difference when assessed by t-test. All pairs show weak positive correlation.

4 | DISCUSSION

This study was carried out to compare between the analgesic effects of the suprascapular nerve block and the standerd nerve block following lap-chole surgeries. Regional anesthetic techniques may be a good alternative rather than systemic analgesic drugs as opioids and non-steroidal anti-inflammatory drugs, as these drugs may be associated with side effects that may be not

tolerated in urological patients especially if they have renal impairment.

Laparoscopic cholecystectomy done under spinal anesthesia may have several advantages over laparoscopic surgery done under general anesthesia. [9] In general, regional anesthesia appears to be sufficient to provide nearly pain-free conditions of peri and post operatively however, it appears not to suffice for achievement of pain-free. However, patients' satisfactions with pain

relief was rated good by 82% of patients in the block group and 40% in the control group with P-value<0.05.

There are number of limitations to this study

First, the study limited assessment of postoperative analgesia to the first 12 postoperative hours, because most of patients left the hospital at this time after operation. As the block was performed with ultrasound guide, no complications were reported in the next week of the patients`surgeon visit postoperatively. The small size of the treatment group may not detect significant numbers of such complications.

Right Suprascapular nerve blocks effective component of multimodal peri and postoperative analgesia for a laparoscopic cholecystectomy procedures under spinal anesthesia. Most reports demonstrate the efficacy of some local abdominal man overs... combination of reduced postoperative opioid requirement, lower pain scores and/or reduction in opioid-related side effects. The present study also demonstrated that supplementing a multimodal analgesic regimen with a Right suprascapular nerve block resulted in reduced pain scores and reduced the overall postoperative analgesic requirements to about 50% in the first 24 postoperative hours compared with the conventional regimen used in the control group. The reasons for this long duration of analgesic effect after single-shot Right SSN blockade may be related to the fact that the suprascapular collection in relatively poorly vascularized, and therefore the clearance of bupivacaine may be slowed when the duration of analgesia is an issue, there is good evidence to support using right SS catheter catheters.

Phrenic nerve paralysis is a common adverse event after an interscalene brachial plexus block; it results in respiratory compromise, particularly in patients with pulmonary disease. Combined infraclavicular and suprascapular nerve blocks provide adequate analgesic coverage after shoulder replacement surgery while minimizing the risk of phrenic nerve blockade., Because the current study is annovative study, so the comparative study done for another Root of anesthesia, where Melnikov et al. found that the

PVB had resulted to significant lower pain scores and lower total analgesic consumption than the TAP block after major gynecologic surgeries [10]. Also, Kaya et al. found that PVB had resulted to significant lower pain scores and significant lower diclofenac sodium consumption than TAP block. They do not recommend the routine use of PVB as it has the longer procedural duration, lower patient satisfaction, increased risk of complications and longer hospital stay [11].

5 | CONCLUSION

Analgesic Efficacy of Suprascapular Nerve Block During and after laproscopic Cholecystectomy under Spinal Anesthesia was an efficacious, safe, potent type of intervention in both occasion SSNB block when used as a part of a multimodal analgesic regimen preoperatively for lap-chole under spinal anesthesia provided safe analgesia with good patients' satisfactions. Severity of pain had a statistical difference when compared according to type of interventional Trials at 3 different situations of comparison during the intra-operative assessment and post-operative assessment at 6 hours and 12 hours. The means of another parameters that including the systolic blood pressure, diastolic blood pressure pulse rate during the intra-operative assessment carrying no significant statistical difference women within the two types of interventions while preoperative systolic and diastolic blood pressure show significant difference. All of pairs regarding the comparison of pre and intra operative assessment regarding pulse rate, systolic blood pressure and diastolic blood pressure show significant statistical difference.

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