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RESEARCH ARTICLE
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EVALUATE THE EFFICACY OF INTRAVENOUS LIDOCAINE AND GABAPENTIN AND THEIR COMBINATION ON POSTOPERATIVE ANALGESIA IN THYROID SURGERIES.

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Abstract:

Background: As described in the report of the Lancet Commission on Global Surgery, Global Surgery 2030, approximately 30% of the global burden of disease can be attributed to surgically treatable conditions, and the role of surgical and anesthesia care in improving the and the economic productivity of countries has aroused the attention of World Health Organization (WHO). An ultimate goal of surgical treatment is approaching better recovery for a high quality of life without complications and sequalae's. More than 80% of surgical patients experience postoperative pain which results in a variety of negative consequences and remains a considerable problem worldwide

Aims and Objectives: To Evaluate the efficacy of intravenous Lidocaine and Gabapentin and their combination on postoperative analgesia in thyroid surgeries.

Materials and Methods: Total 51 patients have been enrolled for the study, After approval from the institutional ethical committee this cross-sectional study was carried out in the department of anesthesiology during the one year period February 2022 to February 2023 in the patients undergoing thyroid surgeries. After written consent the patients were randomly enrolled into three different treatment group for the alleviation of post i.e. L-Group- Lidocaine, G-Group- Gabapentin group, LG-Combination of both the groups. The post pain was assed at 0, 2, 4, 6, 12, 18,24 hrs. by Visual Analogue Scale (VAS) it was tabulated as Mean ± SD analyzed by ANOVA test calculated by SPSS-19 version software.

Results and Observations: Out of 51 patients 17 patients were in each group, L-group and G-Group, LG-Group,The majority of the patients were in the age group of 40 50 i.e. 17(33.33%), followed by 50-60 14(26.67%), 30-40 10(20%), 20-30 7(13.33%), >60 were 3(6.67%) . The severity of the pain as assessed by VAS score was significantly more in the L-Group and G group as compared to LG -Group at 0 ($P<0.05$) 4($p<0.05$), 6($p<0.01$), 12($p<0.01$), 18($p<0.001$), 24 ($p<0.05$) hours. Of post operative time.

Conclusion: The combination of Lidocaine and Gabapentin was found to be superior to individual each drug with respect to less VAS score at various durations of post-operative period

Key Words: Thyroidectomy, Analgesia, Effectiveness, Lidocaine, Gabapentin**,** Post Operative Time, Thyroid surgeries, VAS (Visual Analogue Scale), intravenous**.**

Introduction: Thyroidectomy is a widely applied surgical procedure for management of thyroid diseases. Many patients may complain of moderate to severe postoperative pain following thyroid surgery particularly during the first postoperative day due to various causes including skin incision, extensive tissue dissection, pharyngolaryngeal discomfort after intubation, neck hyperextension, surgical manipulation and inflammation [1] [2]. Surgical manipulations and inadequate pain control can also induce perioperative complex stress response with neurohumoral, metabolic and immunological changes that may be manifested as an increase in heart rate and blood pressure, hyperglycemia and release of different cytokines [3]. Different techniques or medications including local anesthetics infiltration, non-steroidal anti-inflammatory drugs (NSAID) or opioids have been used for postoperative analgesia. Although (NSAID) may be beneficial analgesics, many surgeons do not prefer them in thyroidectomy patients to limit the risk of postoperative bleeding [4] [5]. As described in the report of the Lancet Commission on Global Surgery, Global Surgery 2030, approximately 30% of the global burden of disease can be attributed to surgically treatable conditions, and the role of surgical and anesthesia care in improving the and the economic productivity of countries has aroused the attention of World Health Organization (WHO) [6]. An ultimate goal of surgical treatment is approaching better recovery for a high quality of life without complications and sequalae's. More than 80% of surgical patients experience postoperative pain,[7] which results in a variety of negative consequences and remains a considerable problem worldwide. postsurgical pain (PPP), the incidence of which being up to 30–50%, originating from surgic acute postoperative pain without adequate management, has major negative effects on the individual's quality of life and places a heavy burden to the society disturbing millions of people globally and challenges for perioperative physicians.[8–10.]

Materials And Methods: After approval from the institutional ethical committee this cross-sectional study was carried out in the department of anesthesiology during the one year period February 2022 to February 2023 in the patients undergoing thyroid surgeries. After written consent the patients were randomly enrolled into three different treatment group for the alleviation of post i.e. L-Group- Lidocaine, G-Group- Gabapentin group, LG-Combination of both the groups. The post pain was assed at 0, 2, 4, 6, 12, 18,24 hrs. by Visual Analogue Scale (VAS) it was tabulated as Mean ± SD analyzed by ANOVA test calculated by SPSS-19 version software.

Results and Observations:

Table 1: Age distribution

Age(in years)	Number	%
20-30	7	13.33
30-40	10	20
40-50	17	33.33
50-60	14	26.67
>60	3	6.67
Total	51	100

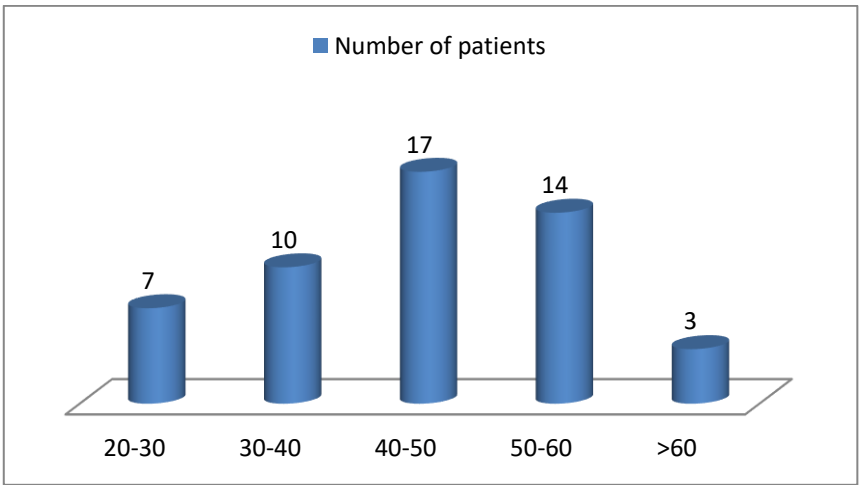

Figure 1- Age distribution

The majority of the patients were in the age group of 40 50 i.e.17(33.33%), followed by 50-60 14(26.67%), 30-40 10(20%), 20-30 7(13.33%), >60 were 3(6.67%) as in table 1 and figure 1.

Table 2: Sex distribution

Sex	Number	%
Male	24	46.67
Female	27	53.33
Total	51	100

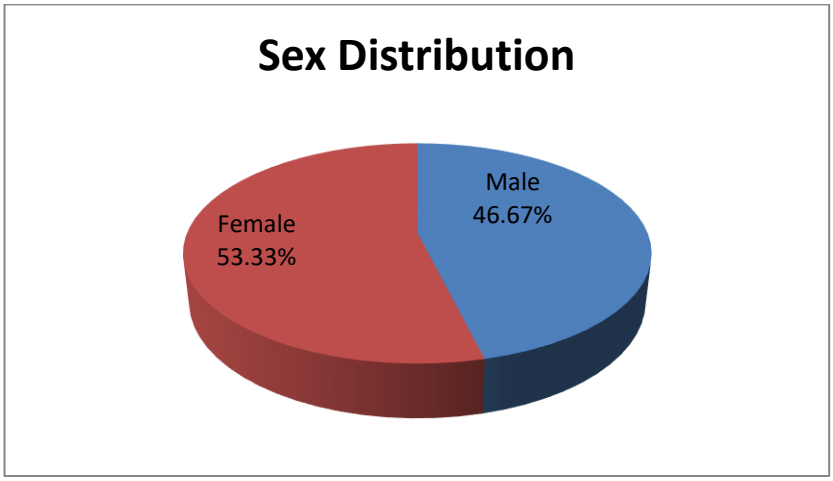

Figure 2- Sex distribution

The majority of the patients were Female i.e. 27(53.33%) and Males were 24(46.67%) as in table 2 and figure 2.

Table 3: Distribution of the patients as per severity pain postoperatively (VAS).

Post operative time(hours)	L-Group N=17	G-Group N=17	LG-Group N=17	P Value (ANOVA)
0	3.3 ± 1.2	2.7±1.13	0.85 ± 0.28	P<0.05
2	2.1 ± 0.89	1.98±0.78	0.72 ± 0.21	P<0.01
4	2.34 ± 0.71	1.84 ±0.82	0.62 ± 0.12	P<0.01
6	2.78 ± 0.92	2.1 ± 0.52	0.52 ± 0.23	P<0.01
12	3.1 ± 0.62	2.92 ± 0.82	0.69 ± 0.13	P<0.01
18	4.1 ± 0.32	3.82 ± 1.31	1.32 ± 0.15	P<0.001
24	3.75 ± 1.2	2.89± 2.1	0.95 ± 0.43	P<0.05

The severity of the pain as assessed by VAS score was significantly more in the L-Group and G group as compared to LG -Group at 0 ($P<0.05$) 4($p<0.05$), 6($p<0.01$), 12($p<0.01$), 18($p<0.001$), 24 ($p<0.05$) hours. Of post operative time.

Discussion: Lidocaine is a local anesthetic drug that produces an analgesic and antihyperalgesic effects by modifying the response of neurons in the dorsal horn to noxious stimuli, and it has an anti-inflammatory effect by inhibiting migration and metabolic activation of leukocytes [10]. Lidocaine can provide these effects through various mechanisms as sodium channel blocking and inhibition of both G protein and NMDA receptors. Many patients may complain of moderate to severe postoperative pain following thyroid surgery particularly during the first postoperative day due to various causes including skin incision, extensive tissue dissection, pharyngolaryngeal discomfort after intubation, neck hyperextension, surgical manipulation and inflammation [11,12]. Surgical manipulations and inadequate pain control can also induce perioperative complex stress response with neurohumoral, metabolic and immunological changes that may be manifested as an increase in heart rate and blood pressure, hyperglycemia and release of different cytokines[13]. Different techniques or medications including local anesthetics infiltration, non-steroidal anti-inflammatory drugs (NSAID) or opioids have been used for postoperative analgesia. Although (NSAID) may be beneficial analgesics, many surgeons do not prefer them in thyroidectomy patients to limit the risk of postoperative bleeding [14.15]. On the other hand, opioids have been associated with some adverse events as respiratory depression and frequent postoperative nausea and vomiting [16, 17]. Therefore it was necessary to find safe analgesic techniques for these patients by using either different adjuvant therapies or multimodal analgesia by combining different drugs and techniques with different modes of action to improve the quality of postoperative analgesia and to decrease the doses of systemic opioids and their related side effects[18,19]. Lidocaine is a local anesthetic drug that produces an analgesic and antihyperalgesic effects by modifying the response of neurons in the dorsal horn noxious stimuli, and it has an anti inflammatory effect by inhibiting migration and metabolic activation of leukocytes[20] Gabapentin (1-aminomethyl cyclohexane acetic acid) is related to the neurotransmitter gamma amino butyric acid (GABA), its analgesic effect is mediatedby binding to the $\alpha 2\delta$ subunit of voltage dependent calcium channels[21,22]. It was mainly used as an anticonvulsant drug, but it has been detected to be effective in diabetic neuropathy, neuropathic pain, and postherpetic neuralgia[23,24,25] . Gabapentin may reduce or prevent acute nociceptive and inflammatory pain especially if given 1 - 2 hours preoperatively. A Previous study had shown synergism between gabapentin and morphine for postoperative analgesia [26]. Some previous meta-analysis reviews stated that gabapentin was an effective adjunct for treatment of the postoperative pain in various procedures and it can be used in multimodal analgesia planes. In our study we have seen that the majority of patients were there in the group of 40-50
I.e. 33.33%, followed by 50-60, 26.67%, 30-40, 20%, 20-30, 13.33%, >60 were 6.67%. Majority of the patients were female i.e. 53.33% and Males were 46.67%.The severity of the pain as assessed by VAS score was significantly more in the L-group and G-group as compared to LG group at 0 ($p<0.05$), 2($p<0.05$), 4($p<0.05$), 6($p<0.01$), 12($p<0.01$), 18($p<0.001$), 24($p<0.05$) hrs. of post-operative time, these findings are similar to Sahar El Shal[21].They found (LG) group had significant lower intraoperative fentanyl and lower postoperative tramadol consumption($p<0.001$), compared to (P), (L) and (G) groups, with prolonged time of first analgesic request ($p < 0.001$) compared to (P) and (L) groups, and lower VAS compared to other groups ($p < 0.001$ or $p < 0.01$).

Conclusion: The combination of Lidocaine and Gabapentin was found to be superior to individual each drug with respect to less VAS score at various durations of post-operative period

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Conflict of interest: None.

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