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GENERAL AND REGIONAL ANAESTHESIA FOR THYROIDECTOMY IN RURAL/SEMI-URBAN NIGERIAN CENTRES

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ABSTRACT

Objective: To evaluate the feasibility and benefits of regional anaesthesia (RA) for thyroidectomy in rural/semi-urban centres.

Design: A prospective study.

Settings: Missionary Hospital Saki, Nigeria and Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria.

Subjects: One hundred and seventy five patients with goitre.

Results: The average time for the anaesthetists to put patients to sleep was 4.06 ± 1.02 minutes, while it took 17.8 ± 2.9 minutes to give the regional block. Post operative laryngeal complications in RA group were very minimal, while in general anaesthesia (GA) group, there were significant complications in 32 (36%) patients laryngeal oedema 15 (17%), erosions in 10 (11%) and ulcer in seven (8%). Cost of surgery in GA was thrice as much as in RA group. Thirty one (35%) with GA had steam inhalation for sore throat. It was possible to converse (laryngeal nerve monitoring) with the patient during operation but not possible with GA group. There was early discharge of patients in RA group.

Conclusion: Regional/local anaesthesia is feasible for some cases of thyroidectomy with a lot of advantages and specifically allows surgeons to converse with the patients during operation -direct laryngeal and other nerve monitoring. Despite advancement in cuff design a lot of lesions still occur from endotracheal intubations.

INTRODUCTION

Traditionally, thyroidectomy is performed under endotracheal general anaesthesia. But situations often arise when this has to be done in selected cases under local/regional anaesthesia. These include inadequate anaesthetic personnel and infrastructure, especially in rural/semi-urban centres in developing countries, growing surgical list, condition of the patient and in some cases of difficult intubation (1-9). Although intubation confers great advantages, and advances in cuff design and care has significantly reduced many of the deleterious effects on the trachea but a lot of lesions still occur (10-15). Further, considering the consequences of laryngeal nerve and other nerve injuries post thyroidectomy, intra-operative monitoring becomes imperative. However, workers are now advocating voice monitoring which is possible under regional anaesthesia (2) as preferable to nerve monitoring under general anaesthesia (3,16-21). To the

best of our knowledge, all the earlier works on this subject were done in advanced and well equipped centres. This might be the first time a similar work is carried out in rural/semi-urban centres with minimum facilities and personnel for anaesthesia. The aim of this paper is to discuss our experiences with the two forms of anaesthesia in thyroid surgery in rural/semi-urban centres in an African set up (Nigeria).

MATERIALS AND METHODS

One hundred and seventy five patients were recruited for the study. Eighty nine patients had thyroidectomy under general anaesthesia (GA, endotracheal intubation) while eighty six had regional anaesthesia (RA, bilateral superficial cervical plexus block with mild sedation).

The patients were randomly selected into the two groups. The eligibility criteria included:

- (i) Simple multinodular or nodular goiter
- (ii) Moderate size goiter (4 - 10cm or 0.25cm³) (Figures 2 and 3)
- (iii) No clinical evidence of thyrotoxicosis with normal values of thyroid function tests.

Exclusion criteria included:

- (i) Giant or very large goiter
- (ii) Clinical evidence of intrathoracic extension with obstructive symptoms
- (iii) Inter current medical illnesses
- (iv) any history of previous reactions to anaesthetic agents as well as lidocaine
- (v) Laryngeal disease
- (vi) Previous difficult intubations or recent endoscopy.

All the patients had subtotal thyroidectomy. The surgeries were performed by the same consultant surgeon and anaesthesia was given by consultant anaesthetists. The rural centre was Missionary Hospital Saki, Nigeria while the sub-urban centre was Olabisi Onabanjo Teaching Hospital, Sagamu, Nigeria. The weight of the glands resected, the total time spent both for the induction of anaesthesia and operations were noted. The total cost of anaesthesia, surgical materials used, the length of hospital stay, recovery periods as well as overall costs of surgery were noted. The specimens resected at operation were also sent for histology.

Tracheobronchoscopy findings before, immediately and two weeks after surgery were documented for the two groups as well as complications like seroma collection, haematoma, tracheitis and nerve injuries. Pre- and post operative questioning of patients were done and specific complaints regarding hoarseness, sore throat, odynophagia and dysphasia were noted.

RESULTS

The 175 patients included 156(89%) females and 19 (11%) males with a median age of 43.9 years \pm 10.5SD. The group I had 89 (51%) patients with general endotracheal (GA) anaesthesia and group II, 86(49%) had surgery under bilateral superficial cervical plexus blockade with mild sedation (RA). The mean hospital stay in group I was 5.7days \pm 2.8SD while the second group 2.3 days \pm 0.3SD ($P < 0.05$ $t = 30.7$). Regional block was successful in all the patients in group II. Endotracheal intubation was not possible in seven (8%) of the patients in group I (so, they were diverted to regional block group). This was as a result of short neck, tracheal narrowing and distortion by the enlarged gland. The average period of tracheal intubation in group I was 79.2mins \pm 12.2 SD. The average time to anaesthetise the patients in group I was 4.06mins \pm 1.02SD while it took an average of just 17.8mins \pm 2.9SD to achieve cervical blockage in group II. The post operative laryngoscopic complications

in group II were essentially same as in pre-operative except for very mild insignificant laryngeal mucosal oedema in a few patients but in group I there were significant complication in 32 patients (36%). There were laryngeal oedema in 15(17%), erosions in ten (11%) and ulcer in seven (8%) patients. The average costs of materials used for the surgery in group I patients which included anaesthetic gases and drugs was ten times that of group II where only 30mls of 2% xylocaine in 1:100,000 adrenalin was used for the block with 10mg diazepam (1vial) and 100mg pethidine (1vial) as sedatives. Post-operatively, 31 (35%) of all the patients in group I had steam inhalation to clear the throat while none in group II. The average operating time in group I was 7.3 mins \pm 11.6SD while that of group II was 75.8 mins \pm 13.7SD ($P = 0.00$).

DISCUSSION

Revisitation and revival of thyroidectomy under other forms of anaesthesia especially local / regional (cervical blockages, both superficial and deep) other than general endotracheal anaesthesia is currently gaining grounds among several workers especially surgeons and anaesthetists working in rural and semi-urban areas in the developing countries (3-6). The reasons which include inadequate anaesthetists to administer general endotracheal anaesthesia, lack of equipment and infrastructure, patients' request in forestalling recurrent laryngeal nerve injury, low cost of operation, low morbidity and mortality with early recovery, discharge from hospital and bed space, were some of the reasons advanced (1-9). More importantly, advocates of voice monitoring as against nerve monitoring under anaesthesia are increasing daily (1,9). The applicability of these techniques is in conformity with the practice and principle of surgery which is based on safety, efficacy, cost effectiveness and patients' satisfaction (16, 24).

In this series, we noted that it was less cumbersome to achieve superficial blockade as against achieving complete anaesthesia under general endotracheal anaesthesia (25-27). Nonetheless, it was paradoxical that awakesness did not even affect the real operating time (time of knife on skin till closure of skin) as the average operating time for the two groups was 73 mins \pm 11.6SD while that of group II was 75.8mins \pm 13.7SD ($P = 0.00$). In addition, seven of the patients in group I had difficult intubation but the surgery was abandoned and later converted to regional blockade, while all the patients in group II had successful regional anaesthesia (11). Though 6% of tracheal intubations are expected to be difficult, our figures compared favourably with others but this was still a disadvantage as none of the patients in the other group had failed regional anaesthesia (11) (Tables 1 and 2).

Table 1*Patient characteristics in the general anaesthesia (GA) and in the regional anaesthesia (RA) groups*

	GA (n=89)	RA (n=86)	P-value
Sex (%female)	93%	94%	
Mean hospital stay	5.7±2.3SD days	0.89±0.3SD days	<0.05 (t=30.7)
Discharge on the day of operation	Nil	30 patients (26%)	

Table 2*Anaesthesia outcome in the two groups*

	GA	RA	P-value
Successful	82(92.5%)	All	
Failed	7(7.5%)	None	
Duration of induction	4.06mins ± 1 0.2SD	17.8mins ±2.9SD	
Complications of anaesthesia	Laryngeal oedema 15(17%) Laryngeal erosion 10 (11%) Laryngeal ulcer 7 (8%)	Insignificant Laryngeal oedema 5 patients	
Average operating time	73mins± 11.6SD	75.8mins± 13.7SD	0.00
Average intubation time	79.2mins± 12.2SD		

As noted in earlier studies, it was cheaper when regional anaesthesia was used to perform thyroidectomy (22-25). We only used 30mls of 2% lignocaine with adrenal in 1:100,000 and sedated with 10mg diazepam with or without 30-100mg pethidine. This was quite cheap as compared to induction of general endotracheal anaesthesia, intra-operative maintenance and immediate post-operative management in the recovery room in group I. The average hospital stay was 5.7days ± 2.8SD while the second group spent an average of 2.3 days ±0.3SD ($P<0.05$ $t=30.7$). Twenty six (30%) of the patients in group II went home as day cases (which made it cheaper) (22-25). The oral intake was not possible in group I until 24 hours after surgery while group II patients started oral intake some 4 hours after surgery (4- 6) (Tables 1 and 2).

The post-operative laryngoscope findings were not significant in the patient with regional blockade, but in the first group, there were laryngeal mucosal, haematoma, erosions, ulcers and significant oedema of the tracheobronchial tree. There was also partial recurrent laryngeal nerve palsy. It is noteworthy that 35% of the group one patients had steam inhalational therapy post operatively (12-15). Bronchoscopic findings two weeks after admission were relatively normal except in three patients with some residual haematoma and one with hoarseness of voice (4,28-30).

Suffice to say that we are not unaware of the complications of regional anaesthesia, namely: vertebrae artery puncture, bilateral phrenic nerve block and epidural subarachnoid spread (1,2,8). But none of these complications occurred in our patients. The most common complaint in 2% of the patients was generalised headache a few hours post operative. But this responded well to simple oral analgesic (paracetamol (4,5). Bed space conservation was an added advantage as 26 (30%) of the group II patients were treated as day cases. In terms of voice monitoring, this was possible with RA group as the patients were awake and could converse with the surgeons and swallow salivary secretions (16-21). Though, direct laryngoscopic examination were carried out at extubation on the group I patients, direct voice monitoring could not be done until six to 24 hours post operatively. We quite appreciate that the number of patients were small and probably due to strict patient selection criteria but most of our findings were in agreement with the results of earlier workers. More so, when one considered this was done in rural/ semi-urban hospital settings (3, 7,10,25-30). In conclusion, although, general endotracheal intubation anaesthesia remains the widely practiced form of anaesthesia, for thyroidectomy, regional anaesthesia is feasible, cheaper, conserves hospital beds and is associated with less complications

(3,7,10,25-30). More importantly, direct voice monitoring is possible intra-operatively and prevents the tracheo-bronchial complications associated with endotracheal intubations (11-15). It could also be practiced in rural and semi-urban centres and in special situations like in amiodarone-induced hyperthyroidism, tracheal deviation and narrowing or in severe respiratory distress induced goiter (1,2,4-6,11,25 -31).

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