



CONTROL OF THE GAG REFLEX DURING DIGITAL INTRA-ORAL RADIOGRAPHY

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ABSTRACT

This study was conducted to investigate the control of the Gag Reflex during Intra-oral Digital Radiography. Occasionally patients in need of an intra-oral digital radiographic examination may manifest the gag reflex on the slightest provocation. The study included 342 male patients ranged between 25 – 45 years of age for whom at least 6 radiographic projections were indicated. The technique followed during intra-oral digital radiography was the bisecting angle technique. The detector used was a real time charge - coupled device (CCD) sensor, more pertinent to size 2 intra – oral dental x-ray film packet. The dimensions of the sensor were 31 x 44 x 6 mm and has a USB ended cable connection. The patients were classified according to their severity of the gag reflex into mild, moderate and severe. Mild and moderate cases were mainly controllable had making use a list of suggested local and psychological precautions. Severe cases were only controlled successfully by the administration of 25 mg orally t.d.s of the anti-emetic drug chlorpromazine hydrochloride the day before radiography.

INTRODUCTION

The involuntary effort to vomit is referred to as Gagging. The cause of which is known as the gag reflex ⁽¹⁾. Occasionally patients in need of an intra-oral digital radiographic examination may manifest the gag reflex on the slightest provocation ⁽²⁾. However, not all patients have the same response;

therefore gaggers usually differ in their threshold for the gag reflex ⁽³⁾.

The gag reflex is commonly initiated by two stimuli namely the psychic and the tactile or physical stimuli ⁽¹⁾. The gag reflex occurs in most patients as a natural reaction to the tactile stimulation of the soft palate, base of the tongue, and parts of the pharynx.

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In some patients this reflex may be so exaggerated so that dental procedures such as placement of an intra-oral x-ray sensor, film or impression making are very difficult or even impossible to perform ⁽³⁾.

The phenomenon of gagging has been presented in most textbooks of dental radiography, and was thoroughly discussed in the prosthetic literature. In spite that many recommendations were suggested for prevention or suppression of the gag reflex the role of systemic anti-emetic drugs has been relatively underestimated ⁽¹⁻⁷⁾.

The purpose of the present study was to investigate the validity of systemic administration of an anti-emetic drug in order to control the gag reflex during intra-oral digital radiography.

MATERIAL AND METHODS

The study included 342 male patients ranged between 25–45 years of age for whom 10 radiographic projections at least 6 of them were posterior projections. All patients were not suffering gagging problems or on medications that stimulate the gag reflex as revealed by their health history.

The technique followed during intra-oral digital radiography was the bisecting angle technique-which is the most commonly used technique in digital radiography with the film supported in position by the patient's finger.

The system used was a real time intra-oral digital system. The detector used was a real time charge - coupled device (CCD) sensor, more pertinent to size 2 intra-oral dental x-ray film packet. The dimensions of the sensor were 31 x 44 x 6 mm with a real active area of 26 x 37 mm and has a USB ended cable connection.

The patients who had a gagging tendency were categorized into 3 categories ⁽⁸⁾ as follows:

Mild: The patient had a gagging tendency, but the radiographic procedure was completed making use of only part of the suggested precautions listed in list (1) ⁽¹⁻⁷⁾

Moderate

The patient reacted violently to placement of the sensor and might remove it after its insertion. There was a massive difficulty in placement of the sensor and the radiographic procedure required many attempts to perform.

Severe

Occasional vomiting, total refusal, so that digital intra-oral radiographs were unobtainable in many regions.

List (1) Suggested precautions for suppressing and reducing gag reflexes during intra-oral radiographic examination ⁽¹⁻⁷⁾.

1. The operator behaves self-confidently and authoritatively convincingly demonstrating technical competence.
2. The operator explains the procedure to the patient in order to gain his confidence.
3. Film placement is done as quickly as possible, and in a gentle and non-irritating manner.
4. The patient is asked to swallow immediately prior to film placement.
5. The examination begins by radiographing regions where gagging is least likely to occur (incisor regions).
6. The patient rinses the mouth with ice-cold water.
7. Salt is placed on the patient's tongue.
8. The patient is requested to initiate deep and audible respiration.
9. The patient holds his/her breathe.
10. The attention of the patient is distracted by
 - (a) Looking fixedly at a point in the room.
 - (b) Concentrating on breathing control (e.g. by counting seconds).

- (c) Performing slow muscular activities requiring concentration (E.g. alternately raising legs to a horizontal position).

11. Large film holders or fingers in the mouth are avoided.

12. The use of surface anesthesia.

The patients were instructed to attend the clinic at 10 am for intra-oral digital radiography. At the time of radiography, the suggested precautions listed in list (1) were tried to all patients with obvious gagging tendency.

The patients in whom not all regions were possible to radiograph were given an appointment in the next day at the same time hour. Till that time the patient was instructed to take 25 mg orally t.d.s⁽⁸⁾ of the anti-emetic drug chlorpromazine hydrochloride* till the time of radiography at which the patients reaction was also recorded.

Statistical Method

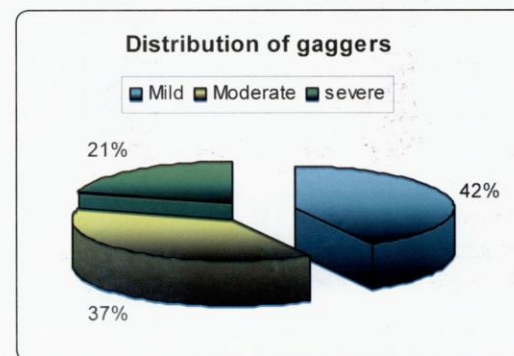
Data were presented as frequencies and percentages. Chi-square (χ^2) test was used for comparisons between different responses.

The significance level was set at $P \leq 0.05$. Statistical analysis was performed with SPSS 16.0** (Statistical Package for Scientific Studies) for Windows.

RESULTS

The total number of patients with an obvious gag reflex were 48 patient out of the 342 patient investigated (i.e. 14 %). The distribution of gaggers in the three categories is shown in table 2 and Graph (1).

The response of gaggers in the three categories to the list of precautions and the anti-emetic drug is shown in table (2) and graph (2).



Graph (1) The distribution of gaggers in the three categories.

TABLE (1) The distribution of gaggers in the three categories.

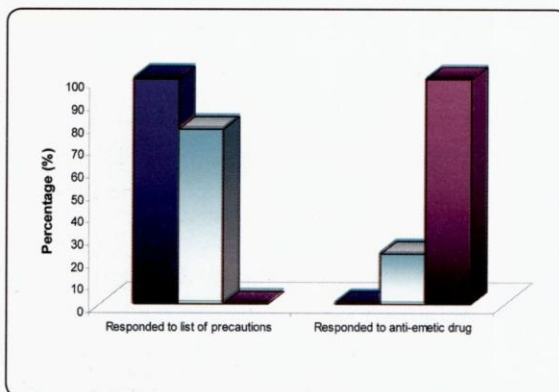
Category	Mild	Moderate	severe	Total
Numbers of gaggers	20	18	10	48
Percentage	41.7	37.5	20.8	100 %

* Neurazine: Misr Co. For PHARM. IND S.A.E

** SPSS, Inc, Chicago, IL, USA.

TABLE (2) The response of gaggers to the different control methods.

Category		Mild	Moderate	Severe	P-value
Responded to the list of precautions in table 1	Number of patients	20	14	0	<0.001*
	%	100 %	77.8 %	0 %	
Responded only to the anti-emetic drug.	Number of patients	0	4	10	
	%	0 %	22.2%	100 %	



Graph (2) The response of gaggers to the different control methods.

The incidence of patients who required a systemic control for the gag reflex was significantly higher ($P < 0.001$) in severe cases than in either the mild or the moderate cases. However there was no statistical significant difference in the number of patients who required the use of the anti-emetic drug between the mild and moderate cases. All patients with mild gag reflex responded to the list of precautions.

DISCUSSION

Gagging is one of the hindering factors during intra-oral digital radiography approximately in 14% of patients up to the extent that some patients may avoid intra-oral radiography for fear of gagging or even intra-oral radiographs are unobtainable. This problem of gagging has been reported many times

to be one of the most perplexing factors during dental procedures⁽⁹⁻¹⁶⁾

Because gagging is caused by both psychic and physical stimuli, many precautions have been suggested to reduce or suppress the gag reflex including both psychological management and local measures⁽¹⁻⁷⁾. Despite that these precautions were strictly followed, some cases were resistant even to all of these precautions.

It was obvious that with both the mild and moderate gaggers the suggested precautions were quite enough to control gagging except in very few cases. However, in the rare cases in which there was, a total refusal of the radiographic procedures or even occasional vomiting, the systemic administration of the anti-emetic drug chlorpromazine hydrochloride eliminated the gag reflex by controlling the psychic factors being a major tranquilizer and the physical factors being; an anti-emetic through its action, on the chemoreceptor trigger zone (CTZ) in the medulla⁽¹⁷⁾. The anti-emetic action of chlorpromazine hydrochloride being a neuroleptic drug mediated by blocking D_2 -dopaminergic receptors of the chemoreceptor trigger zone of the medulla. It has to be strongly considered that not all the anti psychotic drugs are used as anti-emetics⁽¹⁸⁾

The therapeutic dose range of the drug for adults as an anti-emetic is 25-50 mg daily as an anti-emetic and 25-100mg per/day as a tranquilizer.

chlorpromazine hydrochloride was used as an anti-emetic in this study as it of good tolerance and was well tolerated by the patients. It has been pointed out that high doses of the drug may result in drowsiness or constipation^(18, 19).

However, the dose used in this-study (75mg/day) is considered within the therapeutic dose range as both a tranquilizer and an anti-emetic, meanwhile, it could be considered as a small dose. On the other hand, the drug should be avoided in elderly, debilitated patients and patients on barbiturate therapy, aspirin or diazepam and should be used cautiously in patients on antihypertensive drugs⁽¹⁸⁻²⁰⁾. Also, throughout the day of intake, the patients were instructed not to drive vehicles or to use machinery. All patients suffering gagging problems or on medications that stimulate the gag reflex such as the cytotoxic drugs were excluded in order to rule out the possibility of gagging due to factors other than intra – oral digital radiography.

CONCLUSION

The size of the electronic sensor and due to its relative bulky nature may stimulate the gag reflex in some patients. There are many precautions suggested in the literature for reducing the gag reflex during intra-oral radiographic examination may. These precautions could be beneficial for some patients. However, in other patients where the gag reflex is so severe, the administration of a systemic anti-emetic drug the day before dental digital radiography is indicated in order to control the gag reflex.

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