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Original Research

Assessment of efficacy of serum CRP levels as monitoring tools for patients with fascial space infections of odontogenic origin

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ABSTRACT:

Background: Patients with fascial space infections of odontogenic origin are at utmost risk for life-threatening situations due to anatomical connectivity of potential spaces to one another. The present study was conducted to assess efficacy of serum CRP levels as monitoring tools for patients with fascial space infections of odontogenic origin. **Materials & Methods:** 50 patients of fascial space infections of odontogenic origin of both genders were enrolled and swelling size, pain etc. were recorded on Day 0, 4 and 8 and appropriate treatment given to each patient. Blood samples of all the patients were taken and CRP level was assessed as, T1 – before starting any treatment, T2 – 4th day of treatment, and T3 – 8th day of treatment. **Results:** Out of 50 patients, males were 28 and females were 22. The mean CRP level at T1 was 103.2 mg/dl, at T2 was 16.8 mg/dl and at T3 was 4.2 mg/dl. The difference was significant (P< 0.05). The mean swelling at T1 was 18.2 cm, at T2 was 6.2 cm and at T3 was 1.0 cm. The difference was significant (P< 0.05). The mean pain score (VAS) on T1 was 5.6, on T2 was 2.4 and on T3 was 0.8. The difference was significant (P< 0.05). **Conclusion:** CRP is an excellent marker in patients with fascial space infection. Elevated CRP levels accurately reflected the severity of the infection.

Key words: Orofacial and neck infections, CRP, Fascial spaces

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INTRODUCTION

Orofacial and neck infections of odontogenic or non-odontogenic origin are often unpredictable in their course of spread due to the anatomical connectivity of potential spaces. These spaces act as pathways of least resistance to the spread of infection.[1] The advent of modern imaging and diagnostic techniques along with the widespread availability of antimicrobials has immensely reduced the morbidity and mortality associated with fascial space infections. The most commonly encountered portals of entry are the infections of odontogenic origin.[2]

Patients with fascial space infections of odontogenic origin are at utmost risk for life-threatening situations due to anatomical connectivity of potential spaces to one another. Lethal complications may become inevitable making vigilant scrutiny and monitoring of such patients a necessity.[3]C-reactive protein (CRP) is present only in small amounts in normal healthy individuals and is involved in process of innate immune system with functions of compliment activation, antigen clearance, and mediation of phagocytosis by activation. it is the most satisfactory single screening test for an acute phase reaction and a useful marker for the amount of tissue injury and inflammation.[4] The serum concentration reaches its peak within 48 hours, initially rising above 5 mg/l in 6 hours. The plasma half-life of CRP is about 19 hours irrespective of health or disease conditions. Therefore, the intensity of stimulus that triggers the secretion directly reflects the intensity of the pathological process, which defines the plasma CRP concentration.[5]The present study was conducted to assess efficacy of serum CRP levels as monitoring tools for patients with fascial space infections of odontogenic origin.

MATERIALS & METHODS

The present study comprised of 50 patients of fascial space infections of odontogenic origin of both genders. All gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. A thorough oral examination was carried out. Clinical parameters like swelling size, pain etc. were recorded

on Day 0, 4 and 8 and appropriate treatment given to each patient. Discharge samples from infectious site were collected and sent for culture sensitivity and blood sample for assessing values of CRP. Blood samples of all the patients were taken as, T1 – before starting any treatment, T2 – 4th day of treatment, and T3 – 8th day of treatment. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 50		
Gender	**Males**	**Females**
Number	28	22

Table I shows that out of 50 patients, males were 28 and females were 22.

Table II Assessment of CRP level

Period	Mean	P value
T1	103.2	0.02
T2	16.8	
T3	4.2	

Table II, graph I shows that mean CRP level at T1 was 103.2 mg/dl, at T2 was 16.8 mg/dl and at T3 was 4.2 mg/dl. The difference was significant (P< 0.05).

Graph I Assessment of CRP level

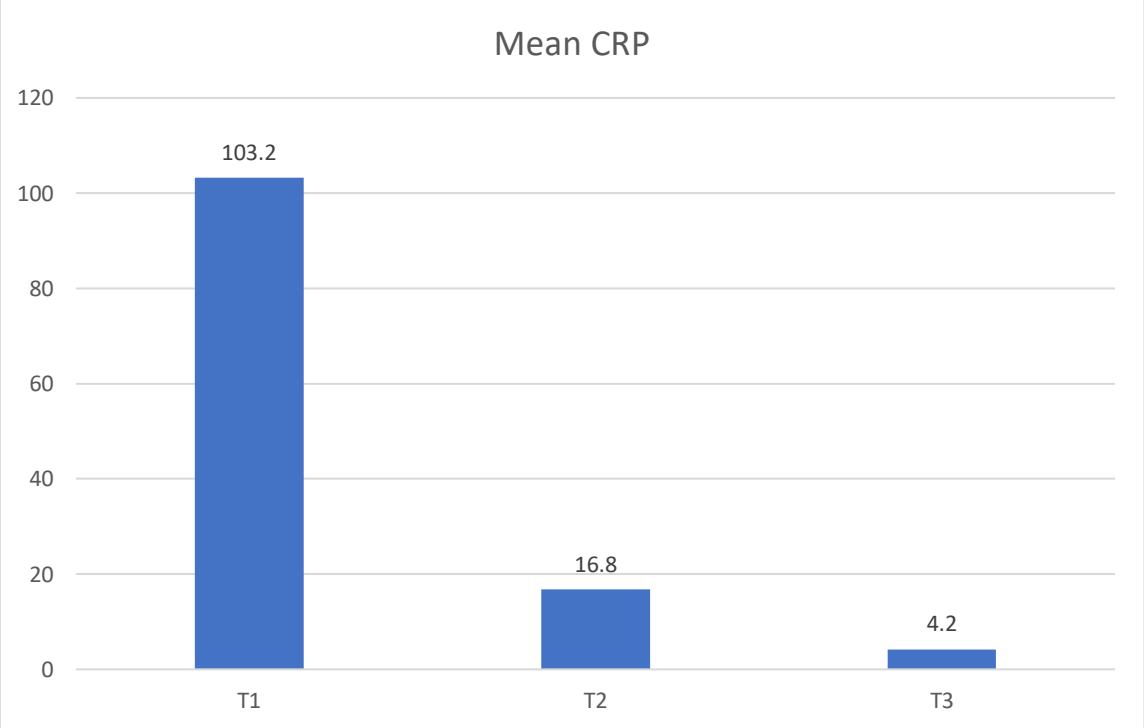

Table III Assessment of swelling

Period	Mean	P value
T1	18.2	0.04
T2	6.2	
T3	1.0	

Table III, graph II shows that mean swelling at T1 was 18.2 cm, at T2 was 6.2 cm and at T3 was 1.0cm. The difference was significant (P< 0.05).

Graph II Assessment of swelling

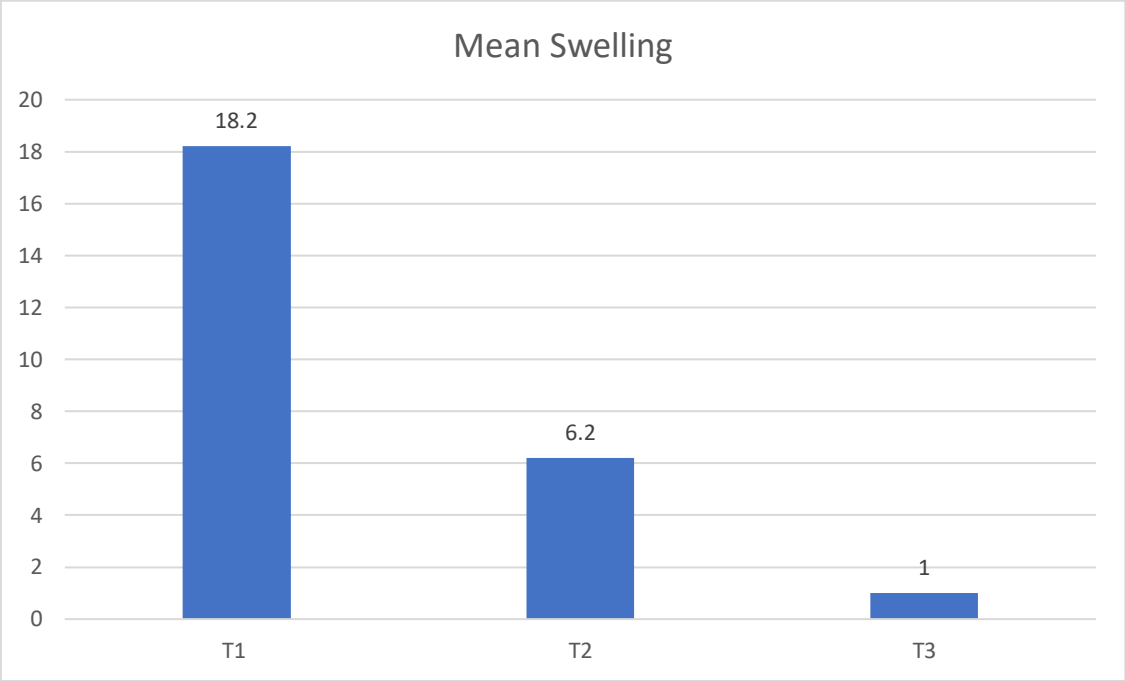

Table IV Assessment of pain (VAS)

Period	Mean	P value
T1	5.6	0.01
T2	2.4	
T3	0.8	

Table IV shows that mean pain score (VAS) on T1 was 5.6, on T2 was 2.4 and on T3 was 0.8. The difference was significant (P< 0.05).

DISCUSSION

The classical clinical presentation of fascial space infection includes the history of progressively increased swelling, fever, trismus and pain associated with dysphagia, dyspnea and change in voice, which evolves rapidly from localized to deep neck-space infection compromising the airway.[6]Toxicity and life-threatening situations like impaired vision, respiratory distress, decreased level of consciousness, meningitis, and cavernous sinus thrombosis can be the sequelae of odontogenic infection.[7] Appropriate antibiotic therapy is the first line of treatment for the resolution of fascial space infection. Infections of fascial spaces are further managed surgically by decompressing the tissues and allowing good perfusion and increased oxygenation by incision and drainage (I&D).[8]The present study was conducted to assess efficacy of serum CRP levels as monitoring tools for patients with fascial space infections of odontogenic origin.

We observed that out of 50 patients, males were 28 and females were 22. The mean CRP level at T1 was 103.2 mg/dl, at T2 was 16.8 mg/dl and at T3 was 4.2 mg/dl. John et al[9] in their study 30 patients with fascial space infection who required incision and drainage (I&D) were included. The clinical parameters of infection such as pain, temperature, swelling, and pus discharge were measured. Laboratory parameters such as serum levels of CRP, Erythrocyte Sedimentation Rate (ESR), and Total Leukocyte Count (TLC) were also estimated. The measures were analyzed prior to I&D on day 1, as well as on third, seventh, eleventh, and fifteenth day of I&D. The mean CRP values dropped from 149.4 ± 81.8 ml/dl on the first day to 3.39 ± 0.9 mg/dl on the final day of assessment (P < 0.001). The CRP values demonstrated a significant positive correlation with ESR and TLC values and clinical parameters of infection

We found that the mean swelling at T1 was 18.2 cm, at T2 was 6.2 cm and at T3 was 1.0 cm. Sharma et al[10]assessed efficacy of serum CRP levels as monitoring tools for determining severity of infections, hospital stay and efficacy of treatment. Blood samples taken on Day 0, 4 and 8 for measuring serum levels of marker. Simultaneously clinical parameters like swelling size, pain etc. were also recorded on Day 0, 4 and 8 and appropriate treatment given to each patient. Statistical analysis found strong correlation between lab. values of markers and parameters used to measure severity of infection. Also, CRP is significant marker for hospital stay. The patients were within age group of 17 to 57 years with 90% males and 10% females. The mean age of males was 40.78 ± 8.41 and that of females was 40 ± 15.56 years. Mandible was involved in 16 patients (80%)

and 4 patients (20%) had infection of maxillary origin. The most prevalent microorganism isolated was streptococcus (85%).

We found that the mean pain score (VAS) on T1 was 5.6, on T2 was 2.4 and on T3 was 0.8.Singh WT, et al[11]demonstrated a significant mean decrease in the swelling size and CRP values with time ($P < 0.01$). The study detected no complications or re-infection during the follow-up of the patients.Pinilla et al[12]found statistically significant correlation between prealbumin and CRP at 2nd day ($r = 0.45$, $P < 0.01$) and 5th day ($r = 0.53$, $P < 0.01$) in infection patients.

The limitation the study is small sample size.

CONCLUSION

Authors found that CRP is an excellent marker in patients with fascial space infection. Elevated CRP levels accurately reflected the severity of the infection.

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