Odontogenic Infection – Associated Hyperglycemia : A Case Report of Submandible Abscess

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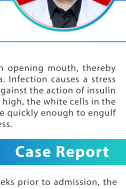

Background

Submandible abscess is one of the most common of deep neck infection. They lead to pain, discomfort and difficulty in opening mouth, thereby complicating the functional activities of oral cavity. It has been clearly documented that abscess induces hyperglycaemia. Infection causes a stress response in the body by increasing the amount of certain hormones such as cortisol and adrenaline. These hormones work against the action of insulin and, as a result, the body's production of glucose increases, which results in high blood sugar levels. When the blood sugar is high, the white cells in the **body** are unable to stop bacteria because they cannot move around at their normal speed and do not reach the infection site quickly enough to engulf and kill the bacteria. The current case report describes the hyperglycaemia can occur in the patient with submandible abscess.

Case Report

We report a case of a 55 years old male patient with swelling at left lower jaw extended to left cheek region. About 2 weeks prior to admission, the patient complained of toothache at left lower jaw, then he went to private clinic at Sukajadi area, and was given 4 kinds of medicine. A swelling and purulent discharge started to occur a few days later. The patient went to our Emergency Department in Hasan Sadikin Hospital Bandung for further treatment. History of systemic disease was denied. Extraoral examintion showing swelling about 7x5x3 cm, hyperemis, diffused, and positive **fluc**tuation. Intraoral examination showing trismus, Spontaneous drainage at gingiva of tooth 38, swelling at left buccal mucosa.

Image 1. Pre Operation

Laboratory examination shows that the blood glucose levels are 233 mg/dL. We diagnosed the patient with left submandible abscess extended to left buccal region due to impacted of tooth 38, chronic apically periodontitis due to radices of teeth 27,47 and reactive hyperglicemia with differential diagnosis diabetes melitus type 2. Internal medicine departement was consulted for assessment and treatment of hyperglicemia. Moderate rehydration was advised and performed. Blood **glu**cose level was re-examined after the moderate rehydration completed and the result was 174 mg/dL. After the hyperglicemia was managed, the patient could be treated safely.

Result

The prior treatments that was performed to the patient were complete blood count, thorax x-ray, rapid test for Covid 19 with non reactive result. The therapeutic intervention consisted of Intravenous IVFD NaCl 0,9% 1500 cc in first 6 hours, and then medication with ceftriaxone 1 gr, metronidazole 500 mg, keterolac 30 mg, and omeprazole 40 mg; The blood glucose level was re-examined and the result was 174 mg/dL. Then tapping pus, incision drainage at left lower jaw and left cheek region, extraction of teeth 22,38,47 and application of penrose drain extraoral and intraoral was performed and the production of **pus** was + 40 cc. The patient was followed up until post-operative day 10 and showing a decrease of swelling an no sign of recurrent infection.

Image 2. Post Treatment

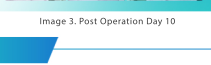

Image 3. Post Operation Day 10

Discussion

Significant alterations to glucose metabolism occur under conditions of stress such infection or sepsis. Stress-induced hyperglycaemia is the result of increased sympathomimetic activity and increased release of counterregulatory hormones and proinflammatory cytokines. Counterregulatory hormones enhance glycogenolysis and gluconeogenesis to increase glucose production. Proinflammatory cytokines are inflammatory mediators that also contribute to increasing glucose production by stimulating gluconeogenesis and glycogenolysis and by indirectly increasing the release of **cou**nterregulatory hormones such as glucagon and cortisol. Furthermore, proinflammatory cytokines contribute to insulin resistance by inhibiting insulin release. The end result of these physiologic changes is increased endogenous glucose production coupled with insulin resistance that leads to stress-induced hyperglycaemia. Infection causes a stress response in the body by increasing the amount of certain hormones such as cortisol and adrenaline. These hormones work against the action of insulin and, as a result, the body's production of glucose increases, which results in high blood **sugar** levels. The patient with a blood glucose level higher than 220 mg/dl, must be given insulin therapy, but in this case, the patient was performed rehidration and re check the patient's blood glucose level. The result of the bood glucose level after the patient got moderate rehydration was 174 mg/dL. Then drainage incision was performed in the left submandible and left buccal region. Treatment of odontogenic infection consist of incision, drainage and extraction of the causative tooth as a source control. Hyperglicemia can altered healing by fluid resuscitation that is why a normal blood glucose level is needed prior to the surgical treatment.

Conclusion

Odontogenic infection can lead to elevation of blood glucose level causing hyperglicaemia, surgical intervention to prevent further spread of submandible abscess must took systemic conditions of the patient into account.

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