RINGKASAN

Sebagian besar penduduk Indonesia masih menggunakan air sumur sebagai sumber penyediaan air untuk minumnya. Di beberapa tempat diketahui terjadi pencemaran nitrat dalam air tanah. Nitrate diketahui dapat mengakibatkan gangguan kesehatan pada manusia. Sehubungan dengan hal itu, penelitian ini bertujuan untuk mengetahui rerata kadar nitrat air sumur dibandingkan dengan batas menurut Departemen Kesehatan RI, pengaruh pemanasan air sewaktu dimasak terhadap kadar nitrat dan kadar nitrit, serta untuk mengetahui hubungan antara kadar nitrat dalam air minum dengan kadar methemoglobin darah penduduk.

Penelitian ini dilakukan di Kelurahan Wonokusumo, Kecamatan Mojosari, Kabupaten Mojokerto, Propinsi Jawa Timur. Penelitian obsernasional ini dilakukan secara potong-melintang (Cross-sectional).

Pengumpulan data yang dilakukan meliputi sampel penduduk, sampel air sumur dan sampel air minum. Setiap penduduk yang diambil sebagai sampel diwawancarai dan diambil sampel darahnya untuk pemeriksaan kadar hemoglobin dan methemoglobin. Sedangkan sampel air untuk pemeriksaan kadar nitrat dan nitrit.

Hasil penelitian menunjukkan bahwa nilai rerata kadar nitrat sumur di daerah penelitian adalah 12,35 mg/l $N\text{-}NO_3$, rerata kadar nitrat air minum. 12,10 mgl $N\text{-}NO_3$. Nilai rerata kadar nitrit air sumur 0,102 mg/l $N\text{-}NO_2$, sedangkan untuk air minum 0,101 mg/l $N\text{-}NO_2$. Nilai rerata kadar hemoglobin 11,59 gr/dl, dan rerata kadar methemoglobin 5,01% Hb. Sebanyak 82,4 % sampel air sumur mempunyai kadar nitrat di atas ambang batas 10,0 mg/l $N\text{-}NO_3$, tetapi semua sampel air tersebut memunyai kadar nitrit di bawah ambang batas 1,0 mg/l $N\text{-}NO_2$ menurut Departeman Kesehatan RI. Sebanyak 88,2 % responden mempunyai kadar methemoglobin di atas batas normal 3 % dari total hemoglobin.

Berdasarkan hasil uji beda diketahui bahwa tidak terdapat perbedaan yang bermakna, baik antara kadar nitrat air sumur dengan air minum ($p = 0,381$), maupun antara kadar nitrit air sumur dengan air minum ($p = 0,768$). Berdasarkan hasil uji korelasi diketahui bahwa terdapat hubungan yang bermakna antara kadar nitrat air minum dengan kadar methemoglobin darah ($r = 0,628$). Berdasarkan hasil analisis regresi diketahui bahwa variabel yang berpengaruh secara signifikan terhadap kadar methermoglobin darah adalah hanya variabel kadar nitrat air minum saja.

Dari hasil penelitian ini dapat disimpulkan bahwa rerata kadar nitrat air sumur daerah penelitian melampaui batas menurut Departemen Kesehatan RI, pemanasan air sewaktu dimasak tidak mengakibatkan perubahan kadar nitrat dan kadar nitrit. Kadar nitrat dalam air minum mempunyai hubungan yang signifikan dengan kadar methemoglobin darah penduduk.

ABSTRACT

Many areas in Indonesia have high nitrate concentration in their ground water. About 65 % of the Indonesian population consume well water. Nitrate may cause denaturation of hemoglobine in the blood to form methemoglobine. The high level of methemoglobine in the blood may decrease the capacity of oxygen transport significantly. The effects of nitrate on human health need to be studied.

The objectives of the study were to know whether the nitrate concentration of well waters at the study site exceeded the safe limit, nitrate concentration of well waters changed when boiled to prepare drinking water, and a correlation existed between nitrate concentration of drinking water and blood methemoglobine concentration.

This observational study was a cross-sectional design. It was conducted at Mojosari District, Mojokerto Regency, East Java Province. In this study 34 subjects were involved, 34 samples of well water and 34 samples of drinking water were collected.

The result showed that the mean of nitrate concentration of well water at the study site (12,35 mg/l NO_3-N) was higher than the maximum allowable concentration according to the Indonesian Department of Health. The mean of nitrate concentration of drinking water samples was 12,10 mg/l NO_3-N. Based on paired samples T-test, there were no difference between the mean of nitrate concentration of well water and drinking water. Based on simple correlation analysis, it was found that a correlation existed between nitrate concentration of drinking water and blood methemoglobine concentration ($r = 0,628$).

It was concluded that the mean of nitrate concentration at the study site was higher than the maximum allowable concentration according to the Indonesian Department of Health. Nitrate concentration of the well water did not change during boiling. Nitrate concentration of the drinking water had a significant correlation with blood methemoglobine concentration of the population.

Key words : air minum, nitrate, nitrite, methemoglobine.