

Abstrak

Diabetes melitus merupakan penyakit metabolik ditandai hiperglikemia akibat gangguan sekresi insulin. Penggunaan obat herbal terstandar (OHT) sebagai terapi alternatif antidiabetes semakin meningkat di Indonesia, namun kajian mengenai biaya dan efektivitasnya dibandingkan metformin masih terbatas. Penelitian ini bertujuan untuk menganalisis biaya dan efektivitas penggunaan OHT dibandingkan metformin sebagai antidiabetes pada tikus putih (*Rattus norvegicus*) model diabetes melitus. Penelitian ini merupakan penelitian eksperimental laboratorium dengan rancangan acak lengkap menggunakan 36 ekor tikus putih jantan galur Wistar yang dibagi menjadi enam kelompok, yaitu kontrol negatif, kontrol positif, metformin, Diabetasol Herbal, Antidiab, dan Glucofit. Diabetes diinduksi menggunakan streptozotocin (STZ) dosis 55 mg/kgBB secara intraperitoneal. Perlakuan diberikan selama 30 hari. Efektivitas diukur berdasarkan persentase penurunan kadar glukosa darah puasa, sedangkan analisis biaya dilakukan menggunakan pendekatan cost-effectiveness analysis (CEA) melalui perhitungan Average Cost-Effectiveness Ratio (ACER) dan Incremental Cost-Effectiveness Ratio (ICER). Hasil penelitian menunjukkan bahwa metformin memiliki efektivitas penurunan kadar glukosa darah tertinggi sebesar 52,3%, diikuti Diabetasol Herbal 43,7%, Antidiab 39,2%, dan Glucofit 35,8%. Total biaya pengobatan selama 30 hari berturut-turut adalah Rp 21.000 untuk metformin, Rp 150.240 untuk Diabetasol Herbal, Rp 103.740 untuk Antidiab, dan Rp 192.240 untuk Glucofit. Nilai ACER terendah diperoleh metformin sebesar Rp 401,53/% penurunan glukosa darah, menunjukkan profil biaya-efektivitas terbaik dibandingkan ketiga OHT. Analisis ICER menunjukkan seluruh produk OHT berada pada kondisi dominated karena memiliki biaya lebih tinggi dengan efektivitas lebih rendah dibandingkan metformin. Berdasarkan hasil penelitian dapat disimpulkan bahwa metformin memiliki keunggulan biaya-efektivitas yang lebih baik dibandingkan Diabetasol Herbal, Antidiab, dan Glucofit pada model tikus diabetes yang diinduksi streptozotocin.

Kata kunci: diabetes melitus, metformin, obat herbal terstandar, cost-effectiveness analysis.

Abstract

Diabetes mellitus is a metabolic disease characterized by hyperglycemia caused by impaired insulin secretion, insulin action, or both. The use of standardized herbal medicine (Obat Herbal Terstandar/OHT) as an alternative antidiabetic therapy has increased in Indonesia; however, studies comparing its cost and effectiveness with metformin are still limited. This study aimed to analyze the cost and effectiveness of standardized herbal medicine compared with metformin as an antidiabetic agent in diabetic white rats (*Rattus norvegicus*). This study was a laboratory experimental study using a completely randomized design involving 36 male Wistar rats divided into six groups: negative control, positive control, metformin, Diabetasol Herbal, Antidiab, and Glucofit. Diabetes was induced using streptozotocin (STZ) at a dose of 55 mg/kgBW administered intraperitoneally. Treatments were given for 30 consecutive days. Effectiveness was measured based on the percentage reduction in fasting blood glucose levels, while cost analysis was performed using the cost-effectiveness analysis (CEA) approach through the calculation of the Average Cost-Effectiveness Ratio (ACER) and the Incremental Cost-Effectiveness Ratio (ICER). The results showed that metformin produced the highest reduction in blood glucose levels at 52.3%, followed by Diabetasol Herbal at 43.7%, Antidiab at 39.2%, and Glucofit at 35.8%. The total treatment costs for 30 days were IDR 21,000 for metformin, IDR 150,240 for Diabetasol Herbal, IDR 103,740 for Antidiab, and IDR 192,240 for Glucofit. Metformin demonstrated the lowest ACER value at IDR 401.53 per percentage reduction in blood glucose, indicating the best cost-effectiveness profile among all treatments. ICER analysis showed that all herbal products were categorized as dominated because they had higher costs but lower effectiveness compared with metformin. In conclusion, metformin demonstrated superior cost-effectiveness compared with Diabetasol Herbal, Antidiab, and Glucofit in streptozotocin-induced diabetic rat models.

Keywords: diabetes mellitus, metformin, standardized herbal medicine, cost-effectiveness analysis,