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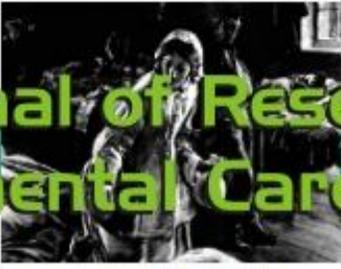
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Federal University of Rio de Janeiro State



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## INTEGRATIVE REVIEW OF LITERATURE

### Análise de custos do transplante alogênico de células-tronco hematopoiéticas: uma revisão integrativa

Cost of hematopoietic stem cell's allogeneic transplantation: an integrative review

Análisis de costo del trasplante alogénico de células madre hematopoyéticas: una revisión integradora

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### ABSTRACT

**Objective:** Identifying what has been produced on cost analysis of allogeneic transplantation of hematopoietic stem cell. **Method:** It consists of an integrative review, where was done a search of studies on cost analysis in allogeneic transplantation. **Results:** There were found 265 articles, which, after application of inclusion and exclusion criteria, 13 articles, with twelve in English and two in Portuguese were selected. Eleven of these articles have made partial cost analysis, a study done systematic review of cost-effectiveness; one made economic evaluation of cost-effectiveness and cost evaluation study made about coverage for curative catheter in transplantation. **Conclusion:** There is a gap in the area of economic evaluation studies and the nurse should occupy this space, not only as a care manager, but also of cost. **Descriptors:** Cost analysis, Allogeneic stem cell transplantation bone marrow.

### RESUMO

**Objetivo:** Identificar o que se tem sido produzido sobre análise de custos do transplante alogênico de células tronco hematopoiéticas. **Método:** Consta de uma revisão integrativa, em que se fez a busca de estudos sobre análise de custos em transplante alogênico. **Resultados:** Foram encontrados 265 artigos dos quais após aplicação dos fatores de inclusão e exclusão foram selecionados 13 artigos, sendo 12 de língua inglesa e dois de língua portuguesa. Onze desses artigos fizeram análise parcial de custos, um estudo fez revisão sistemática sobre custo-efetividade, um fez avaliação econômica de custo-efetividade e um estudo fez avaliação de custo sobre cobertura para curativo de cateter no transplante. **Conclusão:** Existe uma lacuna na área de estudos de avaliação econômica e o enfermeiro deveria ocupar este espaço como gerenciador não só do cuidado, mas também de custos. **Descritores:** Análise de custos, Transplante alogênico de medula óssea.

### RESUMEN

**Objetivo:** Identificar lo que se ha producido en el análisis de costos de trasplante de las células madre hematopoyéticas alogénicas. **Método:** Se trata de una revisión integradora, donde hizo la búsqueda de los estudios sobre el análisis de costos en el trasplante alogénico. **Resultados:** Se encontraron 265 artículos que después de la aplicación de criterios de inclusión y exclusión 13 artículos, con doce en Inglés y dos en Portugués fueron seleccionados. Once de estos artículos han hecho análisis parcial de los costos, un estudio realizado una revisión sistemática de la rentabilidad, una evaluación económica hecha de costo-efectividad y el estudio de evaluación de costos sobre la cobertura de catéter curativa en el trasplante. **Conclusión:** Existe un vacío en el área de estudios de evaluación económica y la enfermera debe ocupar este espacio, no sólo como gestora de la atención, sino también de costo. **Descriptor:** Análisis de costos, Trasplante alogénico de células madre de la médula.

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## INTRODUCTION

**T**ransplantation of Hematopoietic Stem (HSCT) remains the only alternative cells with the potential to cure for several hematologic malignancies.<sup>1</sup>

Technological advances in HSCT increased costs related to treatment in recent decades. Today, it is considered limited the knowledge about the economic aspects in HSCT, as well as its economic impact on our health care system.<sup>1</sup>

The HSCT is classified in the Unified Health System (SUS), as a procedure of high complexity and funding considered strategic by the health ministry, through the Fund for Strategic Actions and Settlements FAEC.<sup>2</sup>

From the administrative point of view, it is an activity that requires materials, medical and nursing staff, the areas of diagnosis and treatment resources. From a technical standpoint, it is a procedure that due to its high complexity; patients are at higher risk and require a greater number of nursing hours due to the need for care and long-term.<sup>3</sup>

The HSCT is a procedure consisting of three phases, the first phase corresponds to the period from pre-transplant evaluation until the end of chemotherapy conditioning, the second phase corresponds to the single-day infusion of new cord, and includes the collection of stem cells, and the third stage is the post-transplant to 100 days.<sup>4</sup>

At the stage of post-transplantation there is a higher incidence of morbidity. In this period the demand is for more professionals, especially the nursing staff, due to variations in the degree of dependence, because a patient who now serves the requests and verbally expresses how he feels can suddenly evolve into a state of coma and multiple organ failure during this period. Complications from the procedure (HSCT) are variable and directly proportional to the increase in direct costs of treatment severities itself, because the higher the gravity, the greater use of technology, supplies and medications and hours worked multidisciplinary team.<sup>5</sup>

Epidemiological data show that in 2013, until the month of March, 356 transplants were performed with the participation of 30 teams across Brazil with 206 autologous and 150 allogeneic.<sup>6</sup> Cost estimates for bone marrow transplantation are found in the scientific literature, referring mainly to other countries.<sup>7</sup> A European study states that the cost difference between autologous and allogeneic HSCT is significant, with an estimated US\$ 25.564 for allogeneic and \$18.000 for autologous (R). In a report of the Court of Audit (TCU), published in 2006, found reports of total spending transplants (all types) in the order of U.S. \$ 185.685.222.00 for the year 2003. In a study published in the United States, spending HSCT per case are of the order of US\$ 193.000,00.<sup>3</sup> Whatever the impact of HSCT in the coffers of the NHS, it is certainly a macroeconomic character, ie, impacts the health system in all regions. Adverse effects associated with the intervention should be included and valued when they are clinically and economically important and or based on significant differences between the intervention and its alternatives studied.<sup>7</sup>

The adverse effects that lead patients to serious health conditions and hence to greater economic expenditure on care of it, should have special attention, with regard to clinical and economic research.<sup>7</sup>

Clinical researches addressing the costs of HSCT are difficult to be conducted, due to the large variation in the protocols used in distinct clinical and support care situations.<sup>8</sup> In recent multicenter European study, published in the year 2012, the total average costs of allogeneic HSCT including selection and collection Hematopoietic stem cells (HSC) transplantation and follow-up of 1 year ranged from US\$ 76.624,00 to US\$ 191.496,00.<sup>9</sup>

The immune vulnerability becomes transplant patients susceptible to a variety of opportunistic infections due to their immune dysfunctions complex system, a condition more critical with the use of certain immunosuppressive treatment. Studies show that infections are a major cause of increased costs with transplantation, including those related to disease Graft-versus-host disease (GVHD).<sup>2,3,7-9</sup> There are few studies in Brazil about the activity of specific nursing relating it as a contribution towards improving the science of care, ie, the quality of care associated with the rational use of resources and reducing expenditures primarily with regard to the assistance of nursing HSCT.

The ability to apply critical thinking and clinical decision making, as well as consulting and collaboration with the multidisciplinary team, contribute to better meet patient demand for acute care.<sup>10</sup> The professional nurse is present in all services and work close to customers has great potential to evaluate and ensure efficient assistance. Nurses who administer health services should be trained with the topic of costs, primarily related to assistance to hospitalized patients.<sup>11</sup>

Therefore, become important studies that address the economic issue, and the economic health evaluation, the most suitable as they allow mapping problems and the impacts of the use of technology in the healthcare system.<sup>11</sup>

The economic evaluation is a formal technique for comparing alternative proposals for action, both in terms of its costs, as the consequences, positive or negative<sup>12</sup> and help managers in the choice of the best alternative. The financing of the health system is a challenge because it is faced with budget constraints facing a growing demand for resources, which leads to an impasse manager in decision making. There are studies of economic evaluation: cost-minimization, cost-effectiveness, cost-benefit and cost-utility. If a study is done only lifting costs then constitutes a partial cost-analysis.<sup>13</sup>

This study aims to make an integrative literature review on cost analysis of allogeneic HSCT, identifying what has been produced on this topic over the past 10 years, according to the following guiding questions: What is the cost of allogeneic HSCT? Are there studies in nursing to address the issue of costs in allogeneic HSCT?

## METHOD

It was developed an integrative review, where was done the search for studies on cost analysis in HSCT. Searches of data were conducted in Medline, LILACS, EMBASE, IBECs, in the months of July and August 2013. For the literature review, we used the PICO anagram, which guides us to formulate a research question and do a search of adequate descriptors. This procedure is a characteristic of evidence-based practice:

<b>P</b>	<b>Paciente</b>	Paciente transplantado de medula óssea
<b>I</b>	<b>Intervenção</b>	Transplante alogênico
<b>C</b>	<b>Comparador</b>	Não há
<b>O</b>	<b>Outcomes (desfechos)</b>	Custos

**Figure 1: PICO Anagram**

The next phase in the pursuit of descriptors for each element of the anagram for each database:

<b>Descritores p/ paciente transplantado de medula óssea</b>
Bone marrow transplant patients or in-patients
<b>Descritores p/ transplante alogênico</b>
Allogeneic bone marrow transplantation or Allogeneic hematopoietic stem cell transplant
<b>Descritores p/ custo</b>
Costs and cost analysis or increased costs or costs or cost control or cost allocation or fees and charges

**Figure 2: Search at Medline.**

<b>Descritores p/ paciente transplantado de medula óssea</b>
Paciente transplantado de medula óssea or pacientes sometidos a transplante de medula óssea or paciente transplantado de células tronco Hematopoéticas or paciente internado or paciente hospitalizado
<b>Descritores p/ transplante alogênico</b>
Transplante alogênico de células tronco Hematopoéticas or transplante alogênico de células madre hematopoyéticas or transplante alogênico de medula ósea
<b>Descritores p/ custo</b>
Costos or custos e análise de custo or costos y análisis de costo or costos directos de serviços or asignación de costos

**Figure 3: Search at LILACS.**

The Embase uses the same descriptors as Medline does. The IBECs uses descriptors of Lilacs. The survey was taken, using the Boolean operators "AND" and "OR" for the association of descriptors. The inclusion criteria were applied: 1) articles published in the last 10 years (2003-2013), 2) English, Portuguese and Spanish; 3) Articles available in full. 4) cost-approach. Exclusion criteria: 1) papers addressing pediatric transplantation. 2) items that only had abstracts, articles on 3) autologous transplantation. The selection process consisted of work: choices for titles and then choose by reading the abstracts. Analysis of the studies was done by thorough reading of selected articles. To organize and provide clarity in publications found a table was used consisting year of publication, database descriptors used, the methodology used in the study, authors and journal.

## RESULTS AND DISCUSSION

Were found 265 items after application of inclusion and exclusion criteria, 13 studies were selected: 12 English-language and two English language were found. Most of the articles found in Medline (13) data and found an article in lilacs. The year that showed the publications was 2012, with 31% of the total. According to the definition Economic Assessment, 11 articles did partial cost analysis in HSCT, a study done a systematic review of cost-effectiveness in Hematopoietic Stem Cell Transplantation, another study did cost-effectiveness analysis of treatment of GVHD and study conducted by nurses did cost assessment on coverage for curative catheter.

Nome do artigo	Base de dados	Author	Ano	Periódico	Metodologia
Economic cost of Peripheral Blood Progenitor Cell in Spain <sup>14</sup>	Medline	Sanches et al.	2004	Medicina cl De Barcelona	Análise parcial de custos
Economic analysis of unrelated BMT: results <sup>15</sup>	Medline	Lissovoy	2005	BMT	Análise total Custo-efetividade
Costs of allogeneic hematopoietic stem cell transplantations <sup>16</sup>	Medline	Svahn	2006	Transplantat ion	Análise parcial de custos
Treatment costs and survival in with grades III-IV <sup>17</sup>	Medline	Svahn	2006	Transplantat ion	Análise parcial de custos
Lower costs associated with HCT using reduced intensity vs high dose regimens for malignancy <sup>18</sup>	Medline	Saito	2007	BMT	Estudo de coorte
Cost of allogeneic HCT with high dose regimens <sup>19</sup>	Medline	Saito	2008	Biol Blood marrow transplantati on	Análise parcial de custos
Costs of hematologic cell transp. Comparison <sup>20</sup>	Medline	Majhail	2009	Ann hemat	Análise parcial de custos
Avaliação das coberturas para sítio de inserção de CVC no TMO <sup>21</sup>	LILACS	Andrade	2011	Reme	Análise parcial de custos
Preditores de mortalidade e custo em TCTH <sup>22</sup>	Medline	Kerbaui	2012	Einstein	Análise parcial de custos
Costs and cost-effectiveness of TCTH <sup>23</sup>	Medline	Preussler	2012	Biol blood marrow transp	Estudo de revisão
High readmission rates are associated <sup>24</sup>	Medline	Digman	2012	Clinical transp	Análise parcial de custos
Real-world costs of autol and allog <sup>25</sup>	Medline	Blommes tein	2012	Ann hemat	Análise parcial de custos
Increased costs after allog hematopoétic <sup>26</sup>	Medline	Svahn	2012	BMO	Análise parcial de custos

Table 1: Articles included.

### Descriptive presentation of the articles found

**Article 1** - Cost of Allogeneic HCT with High Dose Regimens; Author: Akiko Saito; Periódico: Biol Blood Marrow Transplantation; Ano: 2008.<sup>19</sup>

**Objectives:** To characterize the costs of allogeneic transplantation with high-dose conditioning regimens, identify factors related to increased costs in transplantation.

**Methodology:** An observational study in which 315 patients undergoing hematopoietic stem cell transplantation (HSCT) were analyzed over a period of four years, starting in 2000, through multivariate analysis of factors pre and post HSCT related to rising treatment costs.

Results: The average cost of hospitalizations and days of hospitalization were U \$ 102,574 and 36 days of hospitalization in the first 100 days and U \$ 128,800 and 39 days of hospitalization within one year. The initial costs (those within the first 100 days) accounted for 84% of total costs in the first year. Hospitalization costs comprise 94% of the initial costs, but only 61% of subsequent costs defined as costs incurred between 101 days and the first year. Of post HSCT factors, serious complications that increased the total cost U \$ 20 228 were identified. These results provide cost estimates for complicated and uncomplicated procedures as well as the costs for managing specific complications of HSCT.

**Article 2:** Title: Predictors of Mortality and Cost of Hematopoietic Stem Cell Transplantation. Author: Fábio Rodrigues Kerbauy et al; periódico: gestão e Economia em Saúde, ano 2012.<sup>22</sup>

Objectives: To assess the association of risk score (PAM pre-transplantation assessment of mortality) with the cost of transplantation and use it as a cost management tool.

Methodology: it was a retrospective study with a sample of 116 patients of allogeneic and autologous HSCT, being 27 in cohorts allogeneic and 89 in autologous cohorts, in the period from 2004 to 2006, at the Albert Einstein Hospital in Sao Paulo.

Results: (Risk score PAM can be classified into four categories according to the probability of death during the first two years after transplantation: Category 1 less than 25%; category2: 25% to 50%; Category3: 50 % to 75% and grade 4, greater than 75%). According to the risk score PAM it was possible to classify all patients into three risk categories (high, intermediate and low). The average cost in U.S. dollars for the high, intermediate and low risk groups were respectively U\$ 281,000, U\$ 73,000 and U\$ 54,400. The cost of HSCT was significantly different for each PAM risk group (P = 0.008).

**Article 3:** Costs of allogeneic hematopoietic stem cell transplantation. Autor: B.L. Svahn; ano: 2006; periódico: Transplantation.<sup>16</sup>

Objectives: determining the total cost of treatment after allogeneic HSCT; identify factors associated with increased or reduced costs.

Methodology: the costs of 93 patients who underwent allogeneic HSCT between 1998 and 1999 were collected in the five years after the procedure. In the first stage of the study costs the costs of readmission and outpatient follow-up were analyzed from the first day of admission until discharge and then.

Results: The average total cost of five years after HSCT was 139.414 euros. Costs were higher during the first hospitalization (EUR 100.650) and outpatient costs were around 13,066 euros. The total cost for the first year was higher in patients with chronic graft grade II to IV, followed by bacteremia, VOD (veno-occlusive disease of the liver), prophylaxis with GCS-F and patients with acute leukemia. The higher costs are associated with re-transplantation, LMA, prophylaxis with GCSF, hospital care, myeloablative conditioning and major complications of transplantation.

**Article 4:** Costs and Cost-Effectiveness of Hematopoietic Cell Transplantation; autor: Jaime Preussler et al; ano: 2012; periódico: ASBMT.<sup>23</sup>

Objectives: Make a survey of studies on costs and cost-effectiveness HSCT

**Methodology:** A survey of articles published from January 2000 to July 2011 was conducted. The descriptors were economic cost analysis, analysis, economic evaluation, cost-minimization, cost-benefit, cost-utility and cost; descriptors for transplants were allogeneic bone marrow transplantation, autologous bone marrow transplantation, bone marrow transplantation related, Hematopoietic stem cell transplantation (HSCT), and Hematopoietic stem cell transplantation of peripheral blood. A manual search of bibliographies of relevant original studies describing economic evaluation of diseases treatable with HSCT, with the exception of breast cancer was made. There were 205 abstracts, which after screening identified 30 articles, of which 10 were excluded for not describing costs and be narrative review, remaining 20 articles to be included in this review.

**Results:** According to the survey, in the U.S., costs for allogeneic transplantation, ranging from U\$ 80.499 to U\$ 137.564 were identified, according to donor and intensity of the conditioning regimen. An average of U\$ 51.312 for autologous transplantation was found. Some increased costs associated with the transplant as treatment for complications and transplant the patient with advanced disease factors were identified. Hospitalization was the main contributor to increased costs in the first 100 days. The economic impact of long-term care and chronic graft versus host chronic (cGVHD) is unclear. Studies found six examined the cost-effectiveness, but the available findings are not consistent due to variations in the comparison of treatment methods between studies.

**Article 5:** Economic Cost of peripheral blood progenitor Cell in Spain. Autor: Sanchez et al; ano 2004; periódico: medicina Clínica Barcelona.<sup>14</sup>

**Objectives:** To analyze the economic impact of allogeneic HSCT in the health system

**Methodology:** the costs of the 67 transplant patients were analyzed, 48 autologous and allogeneic 19, in a period of two years.

**Results:** The collection of stem cells for autologous HSCT was significantly more expensive compared to allogeneic HSCT. Research expenditures in allogeneic donor evaluation context became more expensive pre transplant. The transplant itself is more expensive in allogeneic, which is explained by longer hospitalization. Total expenditure on autologous HSCT was 24.000 euros and allogeneic HSCT around 34.000 euros.

**Article 6:** Lower costs associated with hematopoietic cell transplantation using reduced intensity vs high dose regimens for hematological malignancy. Autor: Akiko Saito et al, 2007 Periódico: Bone Marrow Transplantation.<sup>18</sup>

**Objectives:** The aim of this study costs HSCT among patients receiving reduced-intensity conditioning with those who received conditioning regimen in high-dose regimens was compared.

**Methodology:** The study population included 457 patients who underwent HSCT from June 2000 to September 2003. 10 patients who had been transplanted for less than a year and 172 patients who received depleted graft, graft incompatible graft cord and carriers of hereditary diseases were excluded in order to improve comparability between the two procedures. The study was an observational cohort where the disease state, severity of condition, the cell source and prophylaxis of GVHD were classified.

Results: The total costs of the system of reduced intensity vs. high-dose regimen in 275 patients were compared over 3 years. The procedures for HSCT with reduced intensity regimen cost US\$ 53.000 less and about 16 fewer days of hospitalization. However, long term clinical results were similar to the other group in accordance with the literature. Although it seems intuitive that early discharge of patients reduce costs, this strategy will only work if reductions are made in the intensity of the conditioning regimen, in order to enable the outpatient HSCT and no increase in relapse rates or other late complications that may increase costs and the need for hospitalizations in later periods.

**Article 7:** High readmission rates are associated with a significant economic burden and poor outcome in patients with grade III/IV acute GvHD. Autor: Digman F. L. et al; ano: 2012; periódico: *Clinical Transplantation*.<sup>24</sup>

Objectives: To assess the impact of GVHD in readmission rates and hospital costs.

Methodology: Retrospective analysis of readmission rates and associated costs in 187 patients undergoing allogeneic HSCT to assess the economic impact of GVHD. The study period was from 2006 to 2009.

Results: The average cost of re-hospitalization was higher in patients with GVHD (EUR 128.860) than in patients without GVHD (13.405 euros). The cost of treatment was significantly higher in patients with GVHD grade III and IV (40.012 euros) compared with patients with grade I and II (24.560). The average cost of re-hospitalization for relapse was higher in the group without GVHD (2.202 euros) compared with the group with GVHD (1.222).

**Article 8:** Real -World Costs of Autologous and Allogeneic Stem Cell transplantations for Haematological diseases: A Multicentre Study. Autor: Blommestein, HM et al; Ano: 2012; Periódico: *Ann Hematol*.<sup>25</sup>

Objectives: To estimate the costs of autologous and allogeneic HSCT for hematologic diseases; Identify key cost factors; Compare the real cost of the procedure with the value that is reimbursed.

Methodology: A retrospective study whose population was patients undergoing HSCT for hematological diseases in the years 2007-2009. The selection was random, in three Dutch university hospitals, whose number was 191 patients. Phases of HSCT (phase 1 selection and collection) were categorized (phase 2 hospitalization), (3 phase high post).

Results: The average cost was found to autologous (45.668 euros). The stage was more expensive transplant hospitalization, cost of 21.124 euros. The average cost for allogeneic Akin was 101.923 euros, and the phase of the least expensive procedure, comparing with the phase of testing and gathering. It was observed that the costs of HSCT with unrelated donor were much higher with an average of 171.482 euros. The average and median costs for HSCT cord were 254.690 and 167.289 euros respectively. This study led to an increase reimbursement rates.

**Article 9:** Costs of hematopoietic cell Transplantation: Comparison of umbilical Cord Blood and matched related Donor transplantation and the Impact of Posttransplant Complications; autor: Majhail, NS et al; ano 2009; periódico: *Biol Blood Marrow transplant*.<sup>20</sup>

**Objectives:** assessing the costs of HSCT cord with myeloablative and non-myeloablative conditioning regimens. Compare HSCT cord with both regimens with bone marrow HSCT; identify factors associated with increased costs.

**Methodology:** This was a retrospective cohort study in a group of patients receiving HSCT adults between 2004 and 2006. A total of 318 eligible patients, 24 were excluded because they were autologous and mini-allo for Multiple Myeloma. The final study cohort consisted of 294 subjects.

**Results:** The total cost for HSCT cord was U\$ 137.564 compared to U\$ 83,583 for combined HSCT (matched). Patients undergoing myeloablative non-myeloablative HSCT and umbilical cord were more prolonged hospitalization, and consequently higher costs. The main factors related to increased costs were: graft failure, dialysis, mechanical ventilation, and prolonged hospitalization.

**Article 10:** Treatment costs and Survival in patients with grades III- V acute graft-versus-host disease after allogeneic stem cell transplantation during three decades autor: B.M. Svahn; ano 2006; periódico: transplantation.<sup>17</sup>

**Objectives:** to survey costs of treating acute GvHD grade III and IV; Calculating the survival of patients with acute GVHD grade III and IV.

**Methodology:** A retrospective study with a sample of 88 patients was divided into three groups:

Group A: HSCT between 1977-1989

Group B: HSCT between 1990-1999

Group C: HSCT between 2000-2004

Treatment costs and survival rates were calculated.

**Results:** increased survival rate of 1 year for the group C of 21% compared with 9% and 8% for groups A and B respectively was observed. Death by Acute GVHD was higher in the re-transplantation. Grade IV acute GVHD was associated with increased cost of treatment. It was concluded that the costs and survival rates associated with acute GVHD have increased in recent years.

**Article 11:** Increased costs after allogeneic hematopoietic complications and re-transplantation; autor: B. M. Svahn et al; ano 2012; periódico: Bone Marrow transplantation.<sup>26</sup>

**Objectives:** To evaluate factors associated with the high cost of transplanting; Compare different conditioning regimens (myeloablative, reduced intensity and non-myeloablative).

**Methodology:** A retrospective study in a single university hospital. 202 patients undergoing allogeneic HSCT were included.

**Results:** The average cost of transplantation in the initial treatment period was 66,756 euros. The average cost for the first year of treatment was 141.493 euros. An increase in costs compared to cord blood transplantation. There were no significant differences between the regimes of reduced intensity and non-myeloablative.

**Article 12:** Economic Analysis of Unrelated Bone Marrow transplantation: results from the randomized Clinical trial T-Cell depletion vs Unmanipulated grafts for the Prevention of

Graft-versus-host diseases economic analysis. Autor: Lissovoy ET AL; ano2005; periódico: Bone Marrow Transplantation.<sup>15</sup>

**Objectives:** To analyze the disease-free survival for three years in patients who received unrelated grafts with T cell depletion; compare these patients with those who received unrelated grafts without T cell depletion Analyzing the costs of treatment for GVHD in both groups. This was a study of cost effectiveness.

**Methodology:** All patients eligible for unrelated HSCT were selected for the study. The first patient was enrolled in March 1995 and the last was in October 2000. It was a cohort study, multicenter (9 centers). Altogether 396 patients were recruited, 194 which received marrow T-cell depletion and cyclosporine protocol, and 204 received bone marrow without manipulation protocol with MTX and cyclosporine. Cost- effectiveness was taken.

**Results:** The cost of treatment can be associated with longer survival, which incurs higher costs. The costs for the two treatment subgroups were similar within the category survival time. Patients receiving marrow cells were less prone to depletion severe cases of GvHD. In the first 100 days after HSCT 64,8% of patients with GVHD degrees of depletion had near zero, while 41.4% of the group experienced no depletion acute GVHD grade III-IV. The average costs increased progressively as the severity of GVHD. Regarding cost-effectiveness, there was no difference in survival at three years, and no difference in benefits for both groups.

**Article 13:** Avaliação das coberturas para sítio de inserção do cateter venoso central no TMO: Análise de custos; autor: Andrade, AM et al; ano 2011, periódico: REME.<sup>21</sup>

**Objectives:** To analyze the utilization and cost of different types of roofing CVC in relation to the frequency of exchange and frequency of device-related infections.

**Methodology:** Data were collected from 68 patients undergoing autologous BMT in UFJF university hospital, from January 2006 to October 2009. Data regarding the technique of dressing covering used (sterile gauze or movie), frequency of replacement and costs derived from these procedures were analyzed.

**Results:** The most repeated toppings were the polyurethane film with 51% usage and 21% with gauze. The cost generated by each use of the film was R\$ 17,74 and the cost generated by each Sterile gauze was R\$ 7,12. As the latter must be changed every 24 hours, your weekly cost was R\$ 49,84. The permanence of the film is 4 to 7 days in 80% of cases. According to Silva, one of the advantages of the polyurethane film is the possible reduction of vascular infection beyond the direct visualization of the insertion site without removing the bandage that provides comfort and well-being of the patient. The change intervals transparent dressing is larger than those with gauze, thus reducing the inputs necessary for its realization, nursing time and consequently the hospital cost.

Economic assessment studies are still scarce in health, even in oncology, and the various treatments are costly. Studies have methodological quality were the most backward, and show that much remains to be done to the level of research in the area of costs.

In studies of transplantation in cost due to the many variables encountered types of transplant treatment protocols, different size samples. All this makes it difficult comparative studies in bone marrow transplantation. If teams develop the full Economic

Assessment, would find it easier to arrive at a better decision in terms of therapy, whether from the point of view of the manager, or the patient.

Most professional studies were responsible for the medical field. It was observed that the authors of these types of repeat study. There is a big difference in the objectives of the various studies. The main concern of the researchers was to raise costs as conditioning regimens, complications and sources of cells. Many associations between factors that could supposedly change the treatment costs were made.

The economic assessment studies, particularly the cost-effectiveness would be interesting to make comparisons between different conditioning regimens; cost-utility studies would be more relevant to compare the benefits of different treatments for graft survival time and disease. Although the studies were heterogeneous, they point to a real need for increased research on cost analysis in Hematopoietic stem cell transplantation.

This treatment of high complexity has been the subject of many clinical trials, bringing new methods of performing the procedure, the costs are very high (). These tests could be accompanied by cost analysis and its impact on the healthcare system where such a group is inserted. We can observe that the multidisciplinary health care team, medicine adds almost all the studies. Nursing has not developed despite the universe works transplantation is extremely rich in nursing care, research and teaching.

Nurses need to do studies on the cost of nursing activities in transplantation, especially of complications requiring many inputs and hours of nursing and how these data could help manage the costs of complications in transplant and recovery of this team in terms of pay.

## CONCLUSION

It follows then that if the nurse fill this gap management that exists in health care, as manager not only care, but also costs, will add a professional value that will make it essential for the health system, in a space awaiting still be busy. It then considers Economic Evaluation in Health is a lack of opportunities.

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