

Establishing a Transplant Program in Emerging Countries

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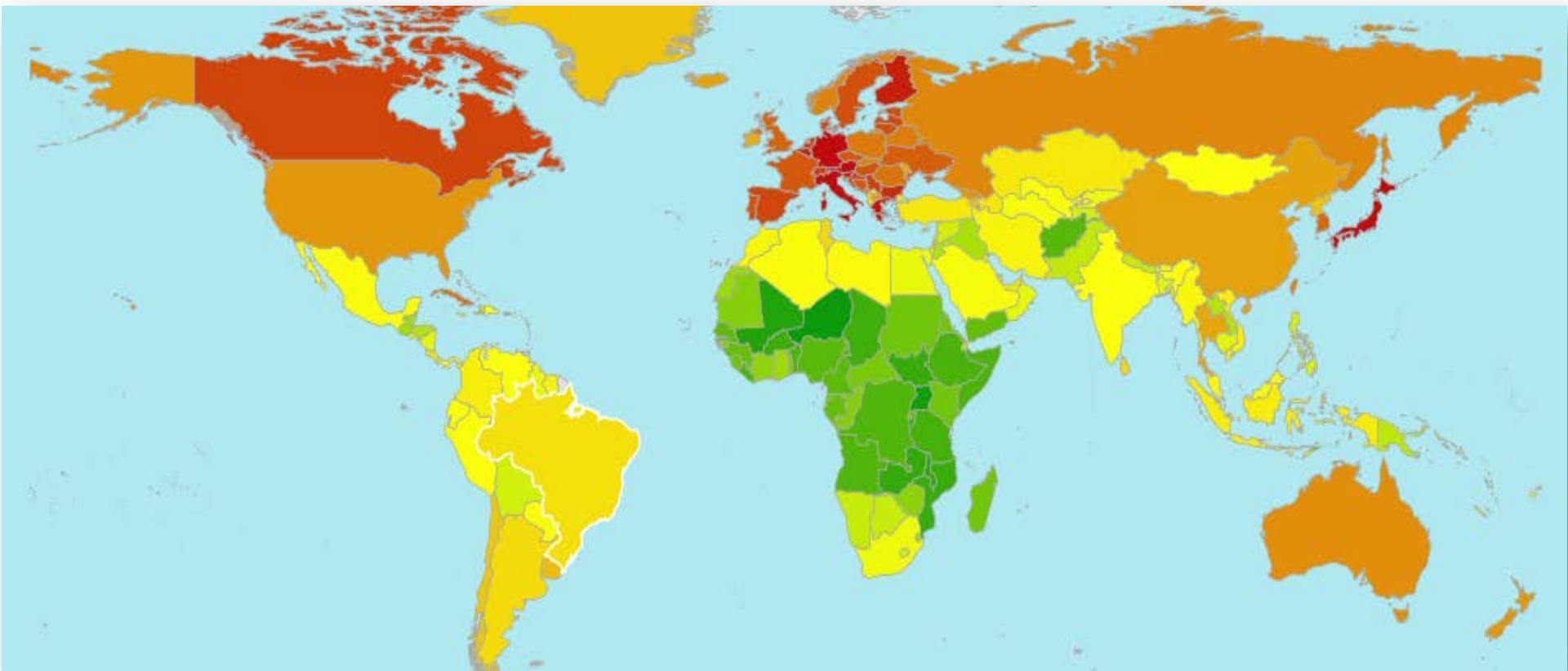
**King Faisal Specialist Hospital &
Research Centre**

Autologous vs Allogeneic Stem Cell Transplant

To Get Started

Difficult to answer this question.

- **What is your priority?**
 - Socioeconomic condition
 - National health care plan
- **What resources do you have?**
 - Are you treating diseases that may require Auto HSCT
- **Diseases that require transplant. ALLO vs Auto.**
 - Inherited disorders
 - Hemoglobinopathies
 - BM failure syndromes
 - Lymphoma, myeloma (Requires more well established health care system)
- **Cost effectiveness and sustainability?**



<http://world.bymap.org/MedianAge.html>

	1957-70	1971-85	1986-91	1992-95	1996-2005	2006-12	Total
Pan-American total	..	2422	14975	33734	126 212	119 140	296 754 (31%)*
Allogeneic	..	2375 (98%)†	7242 (48%)†	12 092 (36%)†	51 347 (41%)†	54 437 (46%)†	127 764
Autologous	..	47	7733	21 642	74 865	64 703	168 990
South East Asian and Western Pacific total	..	505	3349	9120	53 763	73 342	140 079 (15%)†
Allogeneic	..	450 (89%)†	2508 (75%)†	5061 (55%)†	30 340 (56%)†	44 607 (61%)†	82 966
Autologous	..	55	841	4059	23 423	28 735	57 113
Eastern Mediterranean and African total	..	33	300	441	5104	9625	15 503 (2%)*
Allogeneic	..	32 (97%)†	239 (80%)†	357 (81%)†	3821 (75%)†	5968 (62%)†	10 417
Autologous	..	1	61	84	1283	3657	5086
European total	..	6088	21 152	35 660	222 470	215 941	501 315 (53%)*
Allogeneic	..	4165 (68%)†	10 570 (50%)†	12 869 (36%)†	68 970 (31%)†	82 576 (38%)	179 154
Autologous	..	1923	10 582	22 791	153 500	133 365	322 161
Total							
Allogeneic	275 (100%)†	7022 (78%)†	20 559 (52%)†	30 379 (38%)†	154 478 (28%)†	187 588 (45%)†	400 301 (42%)*
Autologous	0	2026	19 217	48 576	253 071	230 460	553 350
Total HSCT	275	9048	39 776	78 955	407 549	418 048	953 651 (100%)*
Cumulative numbers of unrelated donors	..	0	741 994	199 8172	10 777 966	22 346 551	..
Cumulative numbers of cord blood products	..	0	0	2345	275 669	645 646	..

Data are total HSCT by main donor type (allogeneic or autologous HSCT), during the respective timeframe, by WHO region, and the development of cumulative numbers of registered unrelated donors and cord blood products during the same time. All regions are WHO-defined regions. Retrospective allocation of transplants to the respective WHO region is not possible in details. Most procedures were done in the USA and in Europe. HSCT=haemopoietic stem-cell transplantation. *Represents column percentages of total HSCT per WHO region. †Represents proportion of allogeneic HSCT during the respective timeframe in the respective WHO region.

Table 1: Milestones in the development of HSCT, 1957-2012

Allogeneic or Autologous HSCT: Demand vs. Choice OR Reality

- **Pediatric Median age**
- **Inherited disorders**
- **Hemoglobinopathies (Africa, Asia, Middle East)**
- **Bone Marrow failure (Asia, Middle East)**
- **Insufficient health care system is the major factor.**

1. One must look to the future.

2. Develop and progress

Establishing a Transplant Program in Emerging Countries

- **Enhances tertiary care health delivery**
- **Positive outcomes**
- **Obstacles:**
 - **Competition with other priorities**
 - **Need to develop expertise**
 - **Cost containment (cheaper for whom?)**
 - **Financial, legal, ethical considerations**
 - **Develop local experience, education and dissemination of expertise.**

Establishing a Transplant Program in Emerging Countries

- **Financial impact of transplant program**
- **Patient/Disease related factors/Socioeconomic**
- **Centre Experience**
- **Human Resource**
- **Donor selection and HLA typing**
- **Stem Cell Processing Lab/Cryopreservation**
- **Conditioning and Drug Cost**
- **Graft Source (BM vs PB) (with or without cryopreservation)**
- **Alternate Donor Program**
- **Post Transplant factors**
- **Socioeconomic impact and other factors.**

Establishing a Transplant Program in Emerging Countries

- **Financial impact of transplant program**

- Specialized and resource intense.
- HSCT among the top with highest hospital costs

4 economic evaluation to guide decision making

- Cost minimization
- Cost benefit
- Cost effectiveness
- Cost utility

Cost containment program should have clinical and economic effectiveness.

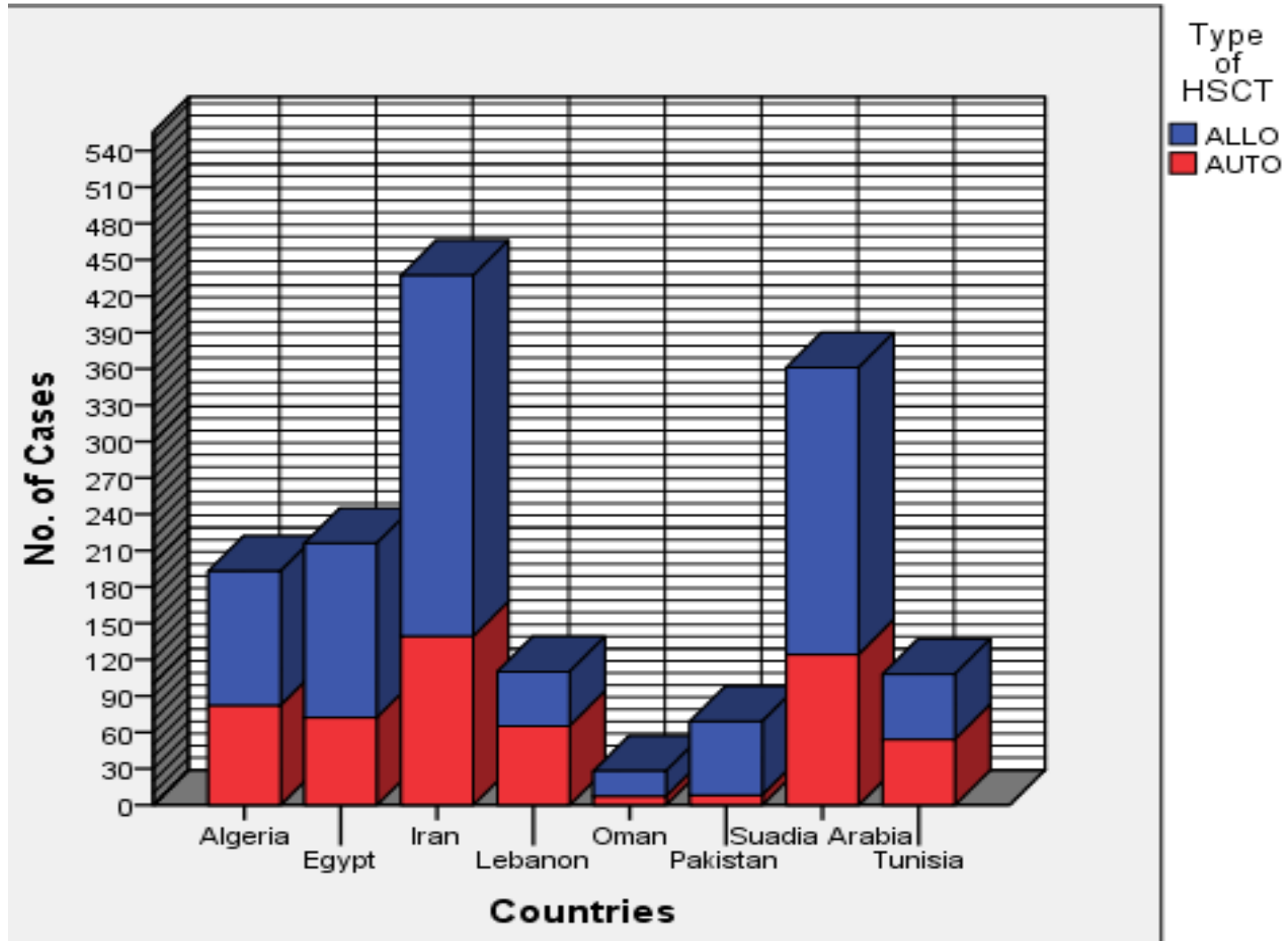
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Blood.2012;120

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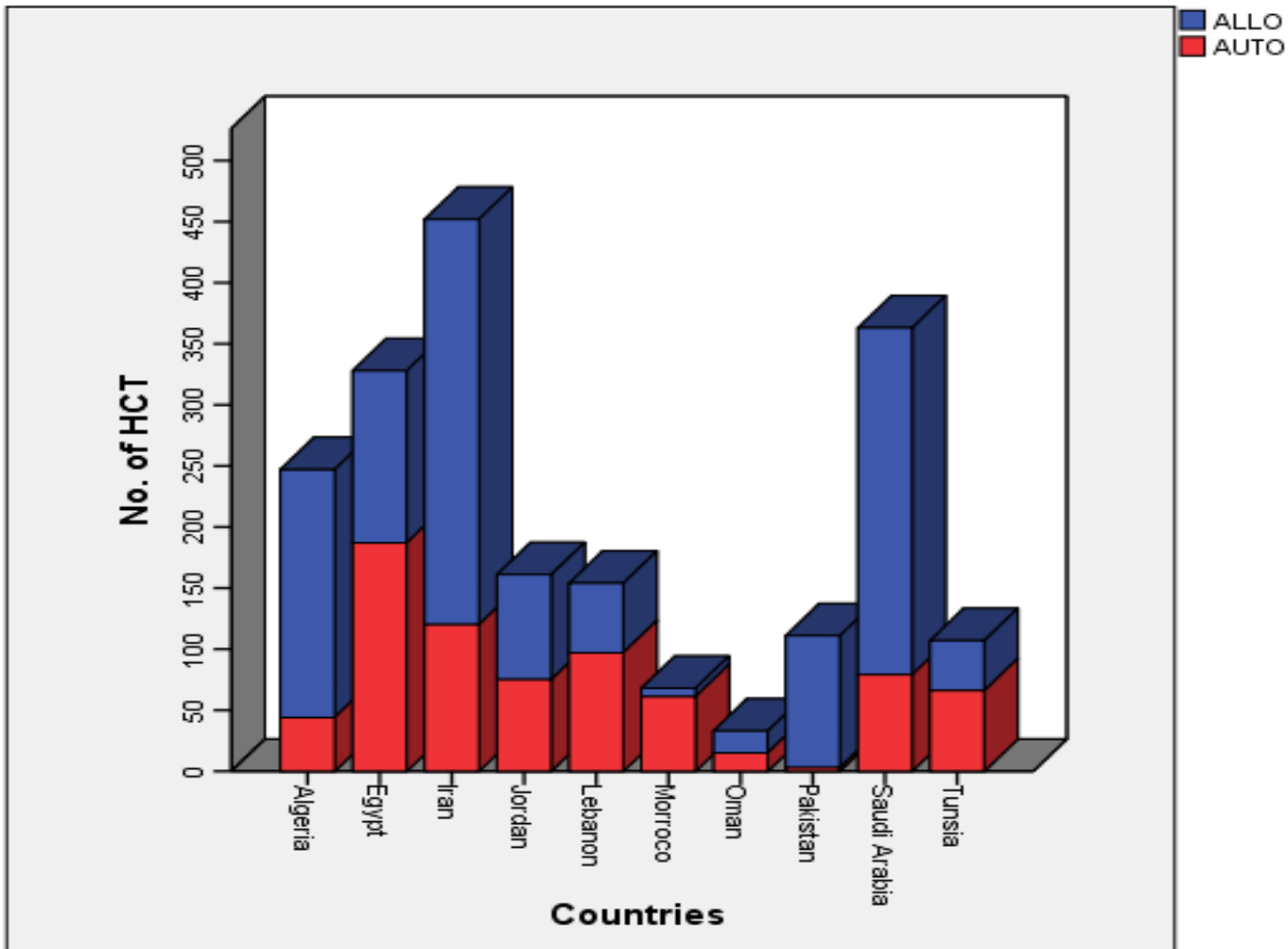
- **Patient/Disease related factors/Socioeconomic**
- Health care facilities not developed for Acute Leukemia or aggressive Lymphoma/Myeloma.
- Non neoplastic disorders becomes the major indication.
 - BM failures
 - Hemoglobinopathies
 - No requirement of prior treatments, prognostic markers or other complex decision making.
- The decision for establishing Allo HSCT program takes precedent because of cost utility and significant impact on QOL and long term survival.

EM Region HSCT Trends by Country: 2012



EM Region HSCT Trends by Country: 2014

Number of AUTO and ALLO HCT by countries



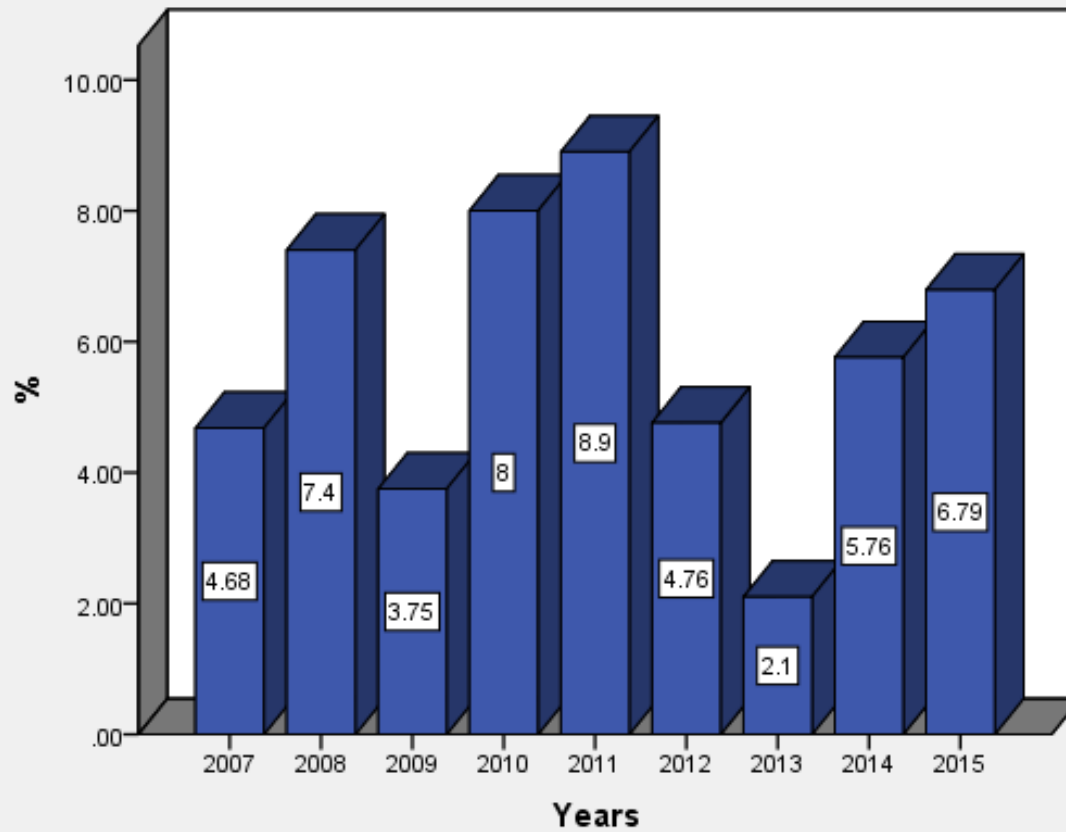
Establishing a Transplant Program in Emerging Countries

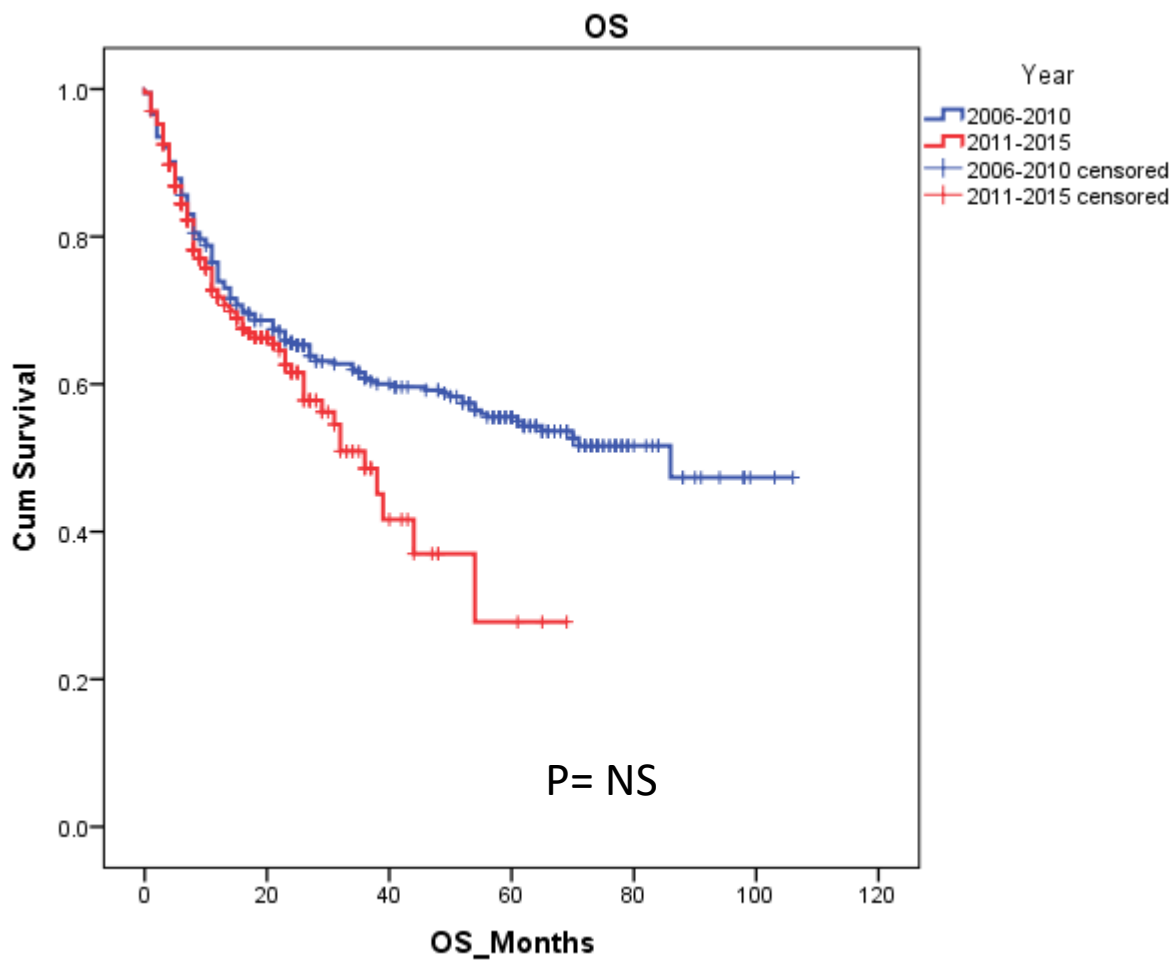
- **Centre Experience**
- **Is it beneficial to start an Auto before an allo-HSCT program**
- **Auto HSCT**
 - Development of skills for staff before starting Allo-HSCT
 - Less complexity
 - Ancillary/support services will continue to improve
- **Allo-HSCT**
 - Beneficial to start with MSD
 - Complexity will require more robust support in all aspects of management
- **Build up local experience**

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Day_100 TRM by years (2007 to 2015): ALLO





Establishing a Transplant Program in Emerging Countries

- **Human Resource (Auto/Allo)**
 - **Well trained staff, training, updated knowledge.**
 - Health care system requirements
 - physical infrastructure,
 - skilled human resource
 - guide lines and multidisciplinary approach for safety and quality,
 - **Cooperation with institutions in developed countries**
 - Facilitate exchange
 - Training

Establishing a Transplant Program in Emerging Countries

- **Cost Reduction in Allo-HSCT vs Auto**
- **Donor selection and HLA typing**
 - MSD transplants: Less Complicated. High resolution typing may not be necessary
 - Outsourcing may be cheaper
- **Conditioning:**
 - RIC: reduced toxicities & long term effects
- **Graft Source: PB vs BM**
 - Cost effective, earlier recovery, 30% cost reduction
- **Drug Costs: 8-39%**
 - Generics
 - Biosimilar
- **Alternate Donor: Haplo likely to be most cost effective**

Establishing a Transplant Program in Emerging Countries

- **Auto HSCT program**
- **Graft Source**
- **Drug cost**
- **HSCT without cryopreservation**
- **Less complications**
- **Less TRM**

Feasibility and safety of autotransplants with noncryopreserved marrow or peripheral blood stem cells: a systematic review

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Bone Marrow Transplantation (2006) 37, 739–743

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www.nature.com/bmt



ORIGINAL ARTICLE

Cyclophosphamide, etoposide and carboplatine plus non-cryopreserved autologous peripheral blood stem cell transplantation rescue for patients with refractory or relapsed non-Hodgkin's lymphomas

M Mabed and T Al-Kgodary

Hematology and Medical Oncology Unit, Faculty of Medicine, Mansoura University, Mansoura, Egypt

Received 3.23.05 | Revisions Received 4.30.05 | Accepted 5.6.05

Extended Storage of Liquid-Preserved Stem Cells at 4°C Results in Good Engraftment in Patients of Multiple Myeloma Undergoing Autologous Stem Cell Transplantation

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Key questions for any new transplant team in view of global data

Unmet need Is there a sufficient large patient population which could profit from HSCT and cannot be served by existing transplant teams within the own or within a neighboring country?

Network Is there an informed disease specific network of physicians for referring and to ascertain post-transplant care?

Resources Are there sufficient resources in infrastructure and personnel to ascertain pre-transplant evaluation, donor search, transplant procedure, after-care, quality management, data collection, and teaching?

Commitment Is there adequate staff and sufficient support from administration, competent authorities and payers to arrive at a reasonable number of HSCT within a reasonable time frame?

GLOBAL PERSPECTIVE ON HSCT

Alois Gratwohl MD, Prof. emeritus

Establishing a Transplant Program in Emerging Countries

- **Auto HSCT will develop as the overall health care services improve.**
- **Allo HSCT is a necessity as it impacts at least 3 basic aspects of socioeconomic achievement:**
 - **Longevity,**
 - **Knowledge,**
 - **Standard of living.**
- **Hence in emerging(low income) countries Allo-HSCT is of prime importance as compared to Auto HSCT programs.**
- **Emerging countries should preferably create centers of excellence.**

Thank you

