Mexican Hip Fracture Audit (ReMexFC): objectives and methodology

Summary

Introduction: Hip fracture (HF) is a public health problem with high morbidity and mortality. In other countries, national HF registries have been made. England launched the National Hip Fracture Database (NHFD) which has registered 30,000 cases. They were followed by Norway, Australia, New Zealand and Spain. These records helped measuring quality indicators, outcomes and decreasing mortality.

Justification: In Mexico there is no national audit on the characteristics of hip fracture.

General Objective: To know the demographic characteristics, assistance, adherence to quality indicators and postoperative outcomes in Mexican Hip Fracture patients.

Methodology: Observational, prospective, epidemiological, descriptive, cross-sectional, multicenter study in different hospitals in Mexico. We included patients 60 years and older with fragility hip fracture. The data suggested by the Frailty Fracture Network (FFN) will be measured, including sociodemographic characteristics, cognitive and functional status prior to fracture, quality indicators and a 30-day follow-up. Readmission and reoperation will be documented, as well as mortality in the acute phase and at 30 days. The information will be analyzed with SPSS of IBPM version 20.0.

Keywords: Hip fracture, Audit, Registry

Introduction

In Mexico 1 out of every 4 adults has osteopenia or osteoporosis, whose most serious consequence is hip fracture (HF). It is estimated that between 8.5% and 18% of women will have a hip fracture throughout their lives. In Mexico City, an incidence of 1.725 cases in women and 1.297 men per 100,000 inhabitants has been reported, and it is believed that it will increase by at least 7 times by 2050.

Hip fracture has been considered a public health problem due to its high impact on morbidity, mortality, dependence and costs. Mortality at one year is near to 25%, only 10% die in the acute phase. On the other hand, only 73% of patients recovered the mobility they had prior to the fracture, which increases the risk of dependence.

In addition to the welfare consequences, the costs of HF also make it a catastrophic entity. In 2002, the Mexican Institute of Social Security (IMSS) spent close to $1,927,072 United States Dollars (USD) on the acute phase of HF, with an average cost per event, up to $12 thousand US dollars. Despite this complex scenario, in Mexico there is currently no multicenter study or registry on the sociodemographic and assistance characteristics on hip fracture. Most of the work has been done in Mexico City, in a single center, so it is not possible to have a global vision of this problem. In other countries in recent years, may efforts have been made to study HF and try to improve its prognosis, increase the quality of care and reduce hospital costs. This through clinical practice guidelines, implementation of multidisciplinary teams, inclusion of the geriatrician in the acute care and the formation of Orthogeriatric units in addition to the publication of recomendations and quality indicators.

Another tool that has been used to improve HF care is the regional and national registries. In 2007, the National Hip Fracture Database was launched in England, which has so far recorded nearly 30,000 hip fractures. Other countries have followed Norway, Australia, New Zealand, Scotland and recently Spain. These records have proven to be useful for situational diagnosis, as well as to improve adherence to quality indicators. After the implementation of the NHFD it was possible to reduce the surgical delay, reaching the goal of surgery in 48 hours or less in 71% of the cases. This impacted on a decrease in mortality in the acute phase. It was also possible to reduce the hospital stay and increase the participation of geriatricians in acute care.

Justification

There is not a multicentric, regional or national audit of fragility hip fractures. This registry will allow a situational diagnosis on this important public health problem, as well as measuring the quality indicators and comparing them among the participating hospitals, and later, in a second time, compare ourselves with other countries in the world. This will facilitate the detection of opportunity points and generate policies that help us improve the prognosis of patients with hip fracture in Mexico.

Goals

i. General Objective: To know the demographics, acute care characteristics, outcomes and quality indicators in patients with hip fracture in Mexico.
ii. Specific objectives:

a) To know the regional variability in demographic, assistance and quality indicators.

b) Know the care characteristics of each Hospital treating Hip Fractures.

c) Compare HF care with quality indicators and clinical practice guidelines, and generate policies to reduce this gap.

d) Compare the results with other countries members of the Fragility Fracture Network.

e) Disclose results to each participating hospital, as well as to local, regional and national authorities.

f) Compare the results of each year of the record with the previous one.

**Methodology**

An observational, prospective, cross-sectional, epidemiological, descriptive, multicenter study will be carried out in different hospital centers of the Mexican Republic. We included patients 60 years and older with fragility hip fracture. An invitation will be made to participate to subinvestigators interested in the hip fracture care of the specialty areas: Traumatology, Internal Medicine, Geriatrics, Rheumatology and related specialties.

An informed consent will be obtained from each patient to be included in the registry, which will be stored in each center and will be subsequently collected digitally. We used variables suggested by the Fragility Fracture Network (FFN) in their Minimum Common Dataset (Table 1). FFN is a non-profit Academic Institution with global representation, dedicated to the global optimization of the multidisciplinary management of fragility fractures.

---

**Figure 1** Shows the timeline of the ReMexFC.

ReMexFC, Registro Mexicano de Fractura de Cadera; UNAM, Universidad Nacional Autónoma de México; FEMECOT, Federación Mexicana de Colegios de Ortopedia y Traumatología; INGER, Instituto Nacional de Geriatría; CONAMEGER, Colegio Nacional de Medicina Geriátrica; FFN, Fragility Fracture Network.

---

**Citation:** Viveros-García JC, Robles-Almaguer E, Albrecht-Junghanns RE, et al. Mexican Hip Fracture Audit (ReMexFC): objectives and methodology. *MOJ Orthop Rheumatol.* 2019;11(3):115–118. DOI: 10.15406/mojor.2019.11.00483
Mexican Hip Fracture Audit (ReMexFC): objectives and methodology

Table 1: Minimum Common Dataset

| In-Hospital Acute Phase and 30 days Followup |
|--------------------------------------------|
| **Patient**                                |
| - Informed Consent                         |
| - Gender                                   |
| - Age                                      |
| - City and Province                        |
| - Name of the Hospital                     |
| - Public of Private Care                   |
| **Baseline Characteristics**               |
| - Residence (Home or Long Term Care)       |
| - Gait evaluation                          |
| - Walking aids                             |
| - Cognition                                |
| - Side                                     |
| - Type of fracture                         |
| - Osteoporosis treatment                   |
| - Functional Status                        |
| - Sore Ulcers                              |
| - Delirium                                 |
| **Acute Care**                             |
| - Date and Time of arrival to ER ¥         |
| - Date and time of arrival to trauma ward  |
| - Date and time of surgery                 |
| - Type of Surgery                          |
| - Surgical delay                           |
| - Cause of surgical delay                  |
| - Type of Anesthetic technique             |
| - Femoral blocking                         |
| - Sore Ulcer                               |
| - Delirium                                 |
| - Multidisciplinary team                   |
| - Sitting after surgery                    |
| - In hospital weightbearing                |
| **Discharge**                              |
| - Discharged to long care or home          |
| - Date of discharge                        |
| - Length of stay                           |
| - Osteoporosis treatment                   |
| - In-Hospital Mortality                    |
| **30 Days Follow-up**                      |
| - Mortality                                |
| - Readmission                              |
| - Surgical Reoperation                     |
| - Gait evaluation                          |
| - Walking aid                              |
| - Functional status                        |
| - Osteoporosis treatment                   |

¥ ER, Emergency Room

These variables include sociodemographic characteristics prior to the fracture, cognitive and functional status as well as their admission to the emergency department, surgical phase, rehabilitation, patient’s condition at discharge, management of osteoporosis and follow-up by telephone or in person at 30 days. In addition, re-admission to the hospital and the requirement for surgical re-intervention will be assessed. Mortality will be measured from the acute phase considering whether it was before, after surgery or within 30 days after discharge.

Each center will collect individually the capture sheets and will be responsible for uploading the data of each patient on a bi-monthly basis to the digital platform. Once sent, the data will be concentrated in a global database, where the personnel that analyze the data generates a blind for the analysis of information.

Histograms of each variable will be reported with the name of the hospital blinded, marking the national average and, on the other hand, the quality indicator suggested by international standards. These reports will be disclosed exclusively to the participating centers. Subsequently, an annual report will be made, which will be published.

Due to the great extension of the Mexican Republic, regional coordinators will be created with the purpose of continuing adding centers to the registry, as well as to solve doubts in the process of capturing patients, filling in the platform for sending the information.

A scientific committee will be created for the periodic analysis of the variables to be measured, and the resolution of will be communicated to the rest of the subinvestigators. The activities carried out in 2018 and 2019 are shown, including the scientific societies that have so far endorsed the project, as well as those that will be requested in the future. The information will be analyzed with the SPSS package of IBM Program version 20.0.

Acknowledgements

To the coordinators of The Spanish National Hip Fracture Registry for their support and counseling.

Conflicts of interest

The author(s) declares that there is no conflict of interest.

References

1. Riera-Espinoza G. Epidemiology of osteoporosis in Latin América 2008. *Salud Pública Mex.* 2009;51 Suppl 1:S52–55.
2. International Osteoporosis Foundation. La Carga Global de la Osteoporosis en Cifras. 2014.
3. Clark P, Lavielle P, Franco-Marina F, et al. Incidence rates and life-time risk of hip fractures in Mexicans over 50 years of age: a population-based study. *Osteoporos Int.* 2005;16(12):2025–2030.

Citation: Viveros-García JC, Robles-Almaguer E, Albrecht-Junghanns RE, et al. Mexican Hip Fracture Audit (ReMexFC): objectives and methodology. *MOJ Orthop Rheumatol.* 2019;11(3):115–118. DOI: 10.15406/mojor.2019.11.00483
4. Johansson H, Clark P, Carlos F, et al. Increasing age-and sex-specific rates of hip fracture in Mexico: A Survey of the Mexican Institute of Social Security. *Osteoporosis Int.* 2011;22(8):2359–2364.

5. González-Montalvo JI, Alarcón T, Hormigo AI. ¿Por qué mueren los pacientes con fractura de cadera? *Medicina Clínica.* 2011;137(8):355–360.

6. Velasco-Marullo V. Fracturas en mujeres posmenopáusicas en el IMSS: frecuencia y costos de su atención hospitalaria. *Gac Med Mex.* 2003;139(5):453–458.

7. Quevedo-Tejero E, Zavala-González MA, Hernández-Gamas A, et al. Fractura de cadera en adultos mayores: Prevalencia y costos en dos hospitales. *Tabasco, México, 2009. Rev Peru Med Exp Salud Pública.* 2011;28(3):440–445.

8. Castañeda P, Cassis N. Mortalidad posterior a fracturas de cadera tratadas en el Centro Médico ABC entre 1996 y 2001. *An Med Assoc Med Hosp ABC.* 2003;48:33–37.

9. Sáez P. 3a actualización en Ortopediatría: Ávila 2015. Capítulo 7 González-Montalvo JI, Alarcón T, Gotor P. ¿Es posible mejorar la atención al paciente con Fractura de Cadera? Aportaciones del Programa FONDA.

10. Alarcón T, González-Montalvo JI, P Gotor, et al. A new hierarchical classification for prognosis of hip fracture after 2 years follow-up. *The Journal of Nutrition, health & Aging.* 2011;15(10):919.

11. Albavera R, López R, Romero C, et al. Mortalidad de pacientes con fractura de cadera a cinco años de evolución en el Hospital Regional General Ignacio Zaragoza. *Rev Exp Med Quir.* 2013;18:31–36.

12. Cree M, Carriere KC, Soskolne CL, et al. Functional dependence after hip fracture. *Am J Phys Med Rehabil.* 2001;80(10):736–743.

13. Pareja-Sierra T, Rodríguez J, Alonso P, et al. Intervención geriátrica en el anciano ingresado por fractura de cadera en el Hospital Universitario de Guadalajara: repercusión clínica, asistencial y económica. *Revista Española de Geriatria y Gerontología.* 2017;52(1):27–30.

14. Clark P, Carlos F, Barrera C, et al. Direct costs of osteoporosis and hip fracture: an analysis for the Mexican healthcare system. *Osteoporos Int.* 2008;19(3):269–276.

15. González-Montalvo JI, Alarcón T, Gotor P, et al. La unidad de ortogeriatría de agudos. Evaluación de su efecto en el curso clínico de pacientes con fractura de cadera y estimación de su impacto económico. *Revista Española de Geriatría y Gerontología.* 2011;46(4):193–199.

16. Sabharwal S, Wilson H. Orthogeriatrics in the management of frail older patients with a fragility fracture. *Osteoporosis Int.* 2015;26(10):2399.

17. Neuberger J, Currie C, Wakeman R, et al. Increased orthogeriatric involvement in hip fracture care and its impact on mortality in England. *Age and Ageing.* 2016;46(2):1–7.

18. NICE. National Clinical Guideline Centre. [The Management of Hip Fracture in Adults]. London: National Clinical Guideline Centre. 2011.

19. Audit Commission. Best Practice Tariffs and Their Impact. London: Audit Commission; 2012.

20. Royal College of Physicians. National Hip Fracture Database annual report 2017. London: RCP, 2017.

21. Hobert M, Gram J, Hermann P, et al. The incidence of hip fractures in Norway-accuracy of the national Norwegian patient registry. *BMC Musculoskeletal disorders.* 2014;15:372.

22. ANZHFR Bi-National Annual Report for Hip Fracture Care 2017. Australian and New Zealand Hip Fracture Registry, 2017.

23. National Services Scotland. Scottish Hip Fracture Audit • Hip Fracture Care Pathway Report 2017.

24. Sáez-López P, González-Montalvo JI, Ojeda-Thies C, et al. Spanish National Hip Fracture Registry (SNHPFR): A description of its objectives, methodology and implementation. *Revista Española de Geriatría y Gerontología.* 2018;53(4):188–195.

25. Neuberger J, Currie C, Wakeman R, et al. The Impact of a National Clinician-led Audit Initiative on Care and Mortality after hip fracture in England. *Med Care.* 2015;53(8):686–691.

Citation: Viveros-García JC, Robles-Almaguer E, Albrecht-Junghanns RE, et al. Mexican Hip Fracture Audit (ReMexFC): objectives and methodology. *MOJ Orthop Rheumatol.* 2019;11(3):115–118. DOI: 10.15406/mojor.2019.11.00483