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A 6-year Survey of the Spectrum of Renal Disorders on Native Renal Biopsy Results in Central Iran, and a Review of Literature

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A 6-year Survey of the Spectrum of Renal Disorders on Native Renal Biopsy Results in Central Iran, and a Review of Literature

Running Title: Prevalence of Renal Biopsy Diagnoses in Iran

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Abstract:

Introduction: Native renal biopsy reports in previous studies that are mostly originated in western countries, show various results in different parts of the world. In this study we aimed to determine the prevalence of renal biopsy disorders in Iran and compare it with other studies in the world.

Methods: This cross sectional study evaluated consecutive native renal biopsies performed in four centers in Isfahan, Iran from 2009 to 2014. We also reviewed other relevant studies in Iran and the world.

Results: Overall, 1547 renal biopsies were reviewed.493cases were excluded (transplant or re-biopsy cases), having a total of 1054 cases (43.3% female) included in our study with a mean (±SD) age of 33.1 (±18.5) years. The first three most prevalent diagnoses were focal segmental glomerulosclerosis (FSGS) (24.8%), minimal change disease (MCD)(14.2%), and membranous glomerulonephritis (MGN)(9.6%). IgA nephropathy (IgAN) was more prevalent among men, whereas lupus nephritis had a higher prevalence in women. In three out of six previous studies conducted in Iran, the most prevalent pathological diagnosis was MGN, in two others MCD predominates, and in the other study FSGS had the highest prevalence. In Europe and Western Pacific Region, IgAN was by far the most prevalent glomerulonephritis, while studies in other parts of the world show conflicting results.

Conclusions: The most prevalent diagnosis in our study was FSGS, which compared to previous studies in Iran, seems to have an increasing prevalence. It has been realized that having a national registry is crucial to determine current status, better planning and management of renal disorders.

Keywords: Epidemiology, glomerulonephritis, Iran, renal biopsy, review

References:

- 1. Aatif T, Maoujoud O, Montasser D, Benyahia M, Oualim Z. Glomerular diseases in the Military Hospital of Morocco: Review of a single centre renal biopsy database on adults. Indian journal of nephrology 2012; 22 (4): 257.
- 2. Chang JH, Kim DK, Kim HW, Park SY, Yoo T-H, Kim BS, et al. Changing prevalence of glomerular diseases in Korean adults: a review of 20 years of experience. Nephrology Dialysis Transplantation 2009; 24 (8): 2406-2410.
- 3. McQuarrie EP, Mackinnon B, Young B, Yeoman L, Stewart G, Fleming S, et al. Centre variation in incidence, indication and diagnosis of adult native renal biopsy in Scotland. Nephrology Dialysis Transplantation 2009; 24 (5): 1524-1528.
- 4. Naini AE, Harandi AA, Ossareh S, Ghods A, Bastani B. Prevalence and clinical findings of biopsy-proven glomerulonephritidis in Iran. Saudi Journal of Kidney Diseases and Transplantation 2007; 18 (4): 556.
- 5. Ossareh S, Asgari M, Abdi E, Nejad-Gashti H, Ataipour Y, Aris S, et al. Renal biopsy findings in Iran: case series report from a referral kidney center. International urology and nephrology 2010; 42 (4): 1031-1040.
- 6. Sugiyama H, Yokoyama H, Sato H, Saito T, Kohda Y, Nishi S, et al. Japan renal biopsy registry and Japan kidney disease registry: committee report for 2009 and 2010. Clinical and experimental nephrology 2013; 17 (2): 155-173.
- 7. Zhao M-h, Zou W-z, Liu G, Wang H. The changing spectrum of primary glomerular diseases within 15 years: a survey of 3331 patients in a single Chinese centre. Nephrology Dialysis Transplantation 2009; 24 (3): 870-876.
- 8. Zaza G, Bernich P, Lupo A. Incidence of primary glomerulonephritis in a large North-Eastern Italian area: a 13-year renal biopsy study. Nephrology Dialysis Transplantation 2012; gfs437.
- 9. Simon P, Ramee M-P, Boulahrouz R, Stanescu C, Charasse C, Ang KS, et al. Epidemiologic data of primary glomerular diseases in western France. Kidney international 2004; 66 (3): 905-908.

- 10. Rivera F, López-Gómez JM, Pérez-García R. Frequency of renal pathology in Spain 1994–1999. Nephrology Dialysis Transplantation 2002; 17 (9): 1594-1602.
- 11. Polito MG, De Moura LAR, Kirsztajn GM. An overview on frequency of renal biopsy diagnosis in Brazil: clinical and pathological patterns based on 9617 native kidney biopsies. Nephrology Dialysis Transplantation 2010; 25 (2): 490-496.
- 12. Arias LF, Henao J, Giraldo RD, Carvajal N, Rodelo J, Arbeláez M. Glomerular diseases in a Hispanic population: review of a regional renal biopsy database. Sao Paulo Medical Journal 2009; 127 (3): 140-144.
- 13. El-Reshaid W, El-Reshaid K, Kapoor M, Madda J. Glomerulopathy in Kuwait: the spectrum over the past 7 years. Renal failure 2003; 25 (4): 619-630.
- 14. Shaker IK, Al-Saedi AJ, Al-Salam S, Saleem MS, Al-Shamma IA. Spectrum of glomerular disease in Iraqi patients from a single center. Saudi Journal of Kidney Diseases and Transplantation 2002; 13 (4): 515.
- 15. Alwahaibi NY, Alhabsi TA, Alrawahi SA. Pattern of glomerular diseases in Oman: A study based on light microscopy and immunofluorescence. Saudi Journal of Kidney Diseases and Transplantation 2013; 24 (2): 387.
- 16. Jalalah SM. Patterns of primary glomerular diseases among adults in the western region of Saudi Arabia. Saudi Journal of Kidney Diseases and Transplantation 2009; 20 (2): 295.
- 17. Karnib HH, Gharavi AG, Aftimos G, Mahfoud Z, Saad R, Gemayel E, et al. A 5-year survey of biopsy proven kidney diseases in Lebanon: significant variation in prevalence of primary glomerular diseases by age, population structure and consanguinity. Nephrology Dialysis Transplantation 2010; 25 (12): 3962-3969.
- 18. Mardanpour K, Rahbar M. Histopathologic patterns of adult renal disease in Kermanshah, Iran: A 6-year review of two referral centers. Caspian journal of internal medicine 2013; 4 (3): 717.
- 19. Mitwalli A, Al Wakeel J, Abu-Aisha H, Alam A, Al Sohaibani M, Tarif N, et al. Prevalence of glomerular diseases: King

- Khalid university hospital, Saudi Arabia. Saudi Journal of Kidney Diseases and Transplantation 2000; 11 (3): 442.
- 20. Rychlík I, Jančová E, Tesař V, Kolský A, Lácha J, Stejskal J, et al. The Czech registry of renal biopsies. Occurrence of renal diseases in the years 1994–2000. Nephrology Dialysis Transplantation 2004; 19 (12): 3040-3049.
- 21. Naumovic R, Pavlovic S, Stojkovic D, Basta-Jovanovic G, Nesic V. Renal biopsy registry from a single centre in Serbia: 20 years of experience. Nephrology Dialysis Transplantation 2009; 24 (3): 877-885.
- 22. Maixnerova D, Jancova E, Skibova J, Rysava R, Rychlik I, Viklicky O, et al. Nationwide biopsy survey of renal diseases in the Czech Republic during the years 1994–2011. Journal of nephrology 2015; 28 (1): 39-49.
- 23. Definition of region groupings. World Health Organization. (Accessed November 30 2016 at http://www.who.int/healthinfo/global_burden_disease/definition_regions/en/).
- 24. Jafari M, Monsef A, Soleimani B. Age and gender distribution of primary and secondary glomerulonephritis obtained by renal biopsy: a study from Hamadan, a great province in Western Iran. Saudi journal of kidney diseases and transplantation: an official publication of the Saudi Center for Organ Transplantation, Saudi Arabia 2015; 26 (2): 375-377.
- 25. Mohammadhoseiniakbari H, Rezaei N, Rezaei A, Roshan SK, Honarbakhsh Y. Pattern of glomerulonephritis in Iran: a preliminary study and brief review. Medical science monitor 2009; 15 (9): PH109-PH114.
- 26. Rahbar M. Kidney biopsy in west of Iran: Complications and histopathological findings. Indian journal of nephrology 2009; 19 (2): 68.
- 27. Das U, Dakshinamurty K, Prayaga A. Pattern of biopsy-proven renal disease in a single center of south India: 19 years experience. Indian journal of nephrology 2011; 21 (4): 250.
- 28. Tisljar M, Horvatic I, Crnogorac M, Toric L, Kasumovic D, Senjug P, et al. MP337Renal biopsy registry from Croatian University hospital-a review of epidemiological data. Nephrology Dialysis Transplantation 2016; 31 (suppl 1): i451-i452.

- 29. Horvatic I, Tisljar M, Bulimbasic S, Bozic B, Ljubanovic DG, Galesic K. Epidemiologic data of adult native biopsy-proven renal diseases in Croatia. International urology and nephrology 2013; 45 (6): 1577-1587.
- 30. Briganti EM, Dowling J, Finlay M, Hill PA, Jones CL, Kincaid-Smith PS, et al. The incidence of biopsy-proven glomerulonephritis in Australia. Nephrology Dialysis Transplantation 2001; 16 (7): 1364-1367.
- 31. Pan X, Xu J, Ren H, Zhang W, Xu Y, Shen P, et al. Changing spectrum of biopsy-proven primary glomerular diseases over the past 15 years: a single-center study in China. New Insights into Glomerulonephritis: Karger Publishers; 2013: 22-30.
- 32. Swaminathan S, Leung N, Lager DJ, Melton LJ, Bergstralh EJ, Rohlinger A, et al. Changing incidence of glomerular disease in Olmsted County, Minnesota: a 30-year renal biopsy study. Clinical journal of the American Society of Nephrology 2006; 1 (3): 483-487.
- 33. Narasimhan B, Chacko B, John GT, Korula A, Kirubakaran MG, Jacob CK. Characterization of kidney lesions in Indian adults: towards a renal biopsy registry. Journal of nephrology 2006; 19 (2): 205.
- 34. Dragovic D, Rosenstock J, Wahl S, Panagopoulos G, DeVita M, Michelis M. Increasing incidence of focal segmental glomerulosclerosis and an examination of demographic patterns. Clinical nephrology 2005; 63 (1).
- 35. Abdou N, Boucar D, Fary KEH, Mouhamadou M, Abdoulaye L, Mourtala KM, et al. Histopathological profiles of nephropathies in senegal. Saudi Journal of Kidney Diseases and Transplantation 2003; 14 (2): 212.
- 36. Malafronte P, Mastroianni-Kirsztajn G, Betônico GN, Romão JE, Alves MAR, Carvalho MF, et al. Paulista Registry of glomerulonephritis: 5-year data report. Nephrology Dialysis Transplantation 2006; 21 (11): 3098-3105.
- 37. Valencia VC, de La Cruz CO, Fuentes JB, Ramírez FF, Michel RP, Aragaki Y, et al. Epidemiology of glomerular disease in adults: a database review. Gaceta Medica de Mexico 2014; 150 (5): 403-408.

- 38. Murugapandian S, Mansour I, Hudeeb M, Hamed K, Hammode E, Bijin B, et al. Epidemiology of Glomerular Disease in Southern Arizona: Review of 10-Year Renal Biopsy Data. Medicine 2016; 95 (18).
- 39. Okpechi I, Swanepoel C, Duffield M, Mahala B, Wearne N, Alagbe S, et al. Patterns of renal disease in Cape Town South Africa: a 10-year review of a single-centre renal biopsy database. Nephrology Dialysis Transplantation 2010; gfq655.
- 40. Barsoum RS, Francis MR. Spectrum of glomerulonephritis in Egypt. Saudi Journal of Kidney Diseases and Transplantation 2000; 11 (3): 421.
- 41. Chen H, Tang Z, Zeng C, Hu W, Wang Q, Yu Y, et al. Pathological demography of native patients in a nephrology center in China. Chinese medical journal 2003; 116 (9): 1377-1381.
- 42. Heaf J, Løkkegaard H, Larsen S. The epidemiology and prognosis of glomerulonephritis in Denmark 1985–1997. Nephrology Dialysis Transplantation 1999; 14 (8): 1889-1897.
- 43. Jegatheesan D, Nath K, Reyaldeen R, Sivasuthan G, John GT, Francis L, et al. Epidemiology of biopsy-proven glomerulonephritis in Queensland adults. Nephrology 2016; 21 (1): 28-34.
- 44. Schena F. Survey of the Italian Registry of Renal Biopsies. Frequency of the renal diseases for 7 consecutive years. The Italian Group of Renal Immunopathology. Nephrology Dialysis Transplantation 1997; 12 (3): 418-426.
- 45. Li L-S, Liu Z-H. Epidemiologic data of renal diseases from a single unit in China: analysis based on 13,519 renal biopsies. Kidney international 2004; 66 (3): 920-923.
- 46. Hur E, Taskin H, Bozkurt D, Sarsik B, Sen S, Ertilav M, et al. Adult native renal biopsy experience of Ege University for 12 consecutive years. BANTAO J 2010; 8 (1): 22-29.
- 47. Bae HJ, Moon KR, Kim YJ, Choi DE, Na KR, Lee KW, et al. Clinical and Histopathological Analysis of the Kidney Biopsies of 2,450 Patients seen over 30 Years at Chungnam National University Hospital. The Korean Journal of Medicine 2013; 84 (3): 379-388.

- 48. Panichi V, Pasquariello A, Innocenti M, Meola M, Mantuano E, Beati S, et al. The Pisa experience of renal biopsies, 1977-2005. Journal of nephrology 2007; 20 (3): 329.
- 49. Parichatikanond P, Chawanasuntorapoj R, Shayakul C, Choensuchon B, Vasuvattakul S, Vareesangthip K, et al. An analysis of 3,555 cases of renal biopsy in Thailand. J Med Assoc Thai 2006; 89 (Suppl 2): S106-S111.
- 50. Carvalho E, do Sameiro Faria M, Nunes JPL, Sampaio S, Valbuena C. Renal diseases: a 27-year renal biopsy study. Journal of nephrology 2006; 19 (4): 500.
- 51. Okpechi IG, Ameh OI, Bello AK, Ronco P, Swanepoel CR, Kengne AP. Epidemiology of Histologically Proven Glomerulonephritis in Africa: A Systematic Review and Meta-Analysis. PloS one 2016; 11 (3): e0152203.
- 52. Kitiyakara C, Eggers P, Kopp JB. Twenty-one-year trend in ESRD due to focal segmental glomerulosclerosis in the United States. American Journal of Kidney Diseases 2004; 44 (5): 815-825.
- 53. Nair R, Walker P. Is IgA nephropathy the commonest primary glomerulopathy among young adults in the USA? Kidney international 2006; 69 (8): 1455-1458.
- 54. Huraib S, Al Khader A, Shaheen F, Aisha HA, Souqiyyeh M, Al Mohana F, et al. The spectrum of glomerulonephritis in Saudi Arabia: the results of the Saudi registry. Saudi Journal of Kidney Diseases and Transplantation 2000; 11 (3): 434.
- 55. Hanko JB, Mullan RN, O'Rourke DM, McNamee PT, Maxwell AP, Courtney AE. The changing pattern of adult primary glomerular disease. Nephrology Dialysis Transplantation 2009; gfp254.
- 56. Brazdziute E, Miglinas M, Gruodyte E, Priluckiene J, Tamosaitis A, Bumblyte IA, et al. Nationwide renal biopsy data in Lithuania 1994–2012. International urology and nephrology 2015; 47 (4): 655-662.
- 57. Gesualdo L, Di Palma AM, Morrone LF, Strippoli GF, Schena FP. The Italian experience of the national registry of renal biopsies. Kidney international 2004; 66 (3): 890-894.
- 58. Stratta P, Segoloni GP, Canavese C, Sandri L, Mazzucco G, Roccatello D, et al. Incidence of biopsy-proven primary

glomerulonephritis in an Italian province. American journal of kidney diseases 1996; 27 (5): 631-639.

59. Covic A, Schiller A, Volovat C, Gluhovschi G, Gusbeth-Tatomir P, Petrica L, et al. Epidemiology of renal disease in Romania: a 10 year review of two regional renal biopsy databases. Nephrology Dialysis Transplantation 2006; 21 (2): 419-424.