Review Article

Rein cardiaque: Historical Notes on Cardiorenal Syndrome

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Cardiorenal syndrome · Cardiac kidney

Abstract

Cardiorenal syndrome describes an active inter-relationship between heart and renal mal-function. The notion of passive renal congestion because of heart dysfunction and the informative term “rein cardiaque” by the French pathologist *Frédéric Justin Collet* (1870–1966) that reiterates revolutionized physiological thinking based on autopsy findings will be briefly discussed here.

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The intellectual movement of direct observation and inductive reasoning evolved during the 18th and 19th centuries. The process of conceiving new ideas and logical methods of examination shaped much of medical thinking. This enlightenment epoch in medicine started in anatomy and then moved toward physiology and pathology [1]. Pioneers of this period revolutionized physiological thinking based on the autopsy-based anatomical findings [2]. Generation of new information on renal structure and function continued and it was before and in the interval between the two World Wars that the functions of the glomerulus and different segments of the tubule began to be elucidated [3]. *Frédéric Justin Collet* (1870–1966) was a French pathologist and otolaryngologist who studied in Lyon and in 1901 became professor of general pathology. We found the notion of passive renal congestion because of heart dysfunction and the informative term “rein cardiaque” in the 1903 edition of his book, *Précis de pathologie interne* [4]. The following English translation of the corresponding page (p. 1087; Fig. 1) and picture (p. 1089; Fig. 2) belong to the 1931 edition of the book, *Précis de pathologie interne* [5]:

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Fig. 1. Corresponding page related to cardiorenal syndrome. From Collet [5].

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Renal Congestion

The kidneys are predisposed to congestions because of their abundant vasculature.

1 Etiology – Renal congestions are usually divided into active and passive.

A. Passive Congestion – Venous stasis, that is, the prolonged return of the circulation, is the principal cause of renal congestion; it is the one observed in different diseases of the heart especially mitral diseases, tricuspid insufficiency, asystole, and compression of the inferior vena cava; it is termed passive congestion or cardiac kidney.

B. Active Congestions – Other congestions known as active are grouped as follows:

(a) *Intoxications* – All intoxication can have an effect on the kidney. Poisons are eliminated in the kidney by filtration or metabolism. Poisoning by cantharides represents the experimental model of these congestions, and is sometimes encountered clinically after the prolonged application of blistering agents in some susceptible individuals.

(b) *Infections* – Among infections we must point out scarlet fever, pneumonia, tuberculosis, rarely diphtheria, and exceptionally secondary syphilis. Infections act by intoxications: the soluble products of diphtheria, the tubercles of Koch can produce vasodilatation independent of their infectious microbial actions.

These renal congestions, as well as those of intoxications, are the initial stage of an acute nephritis. The same can be said of renal congestion due to cold exposure. Exception must be made for malarial pernicious fevers that cause hematuria or hemoglobinuria (Kelsch and Kiener).

Fig. 2. “Rein cardiaque” with infarcts and scar. The signature of the artist is visible in the lower right corner of the picture. From Collet [5].

(c) *Nervous Cause* – The kidney has a vaso-motor enervation, as shown in emotional polyuria. Lesions of the prostate or the bladder can produce renal congestion by reflex vasodilatation (Guyon). Ballet has observed renal hemorrhages after epileptic attacks.

(d) *Foreign Bodies* – Congested kidneys with hemorrhages are often encountered with hydatid cysts, renal calculi, disseminated renal tuberculosis, and cancer.

(e) *Bright's Disease* – Bright's disease at its onset or during its progression is sometimes accompanied by severe renal congestion and heavy hematuria (Dieulafoy); it is then the first evidence of an unsuspected severe interstitial nephritis.

A few words describe visionary thinking and contributions of the heart on renal circulation and renal congestion. The concept of cardiac kidney is visible in the 1892 edition of William Osler's book [6]. The morbid anatomical features of the disease that were practiced in the 19th and early 20th century subsequently declined and pathologists who perform them face extinction [7]. The concept of renal congestion in cardiac failure was the achievement of morbid gross pathology studies. A clinical autopsy was a strong tool for pathological and clinical correlation and for understanding the mechanisms. The future practice of medicine will be blind to this area. The concept of passive renal congestion for decades was not overly considered and nearly all attention was turned toward the decline of renal arterial perfusion in heart failure. Renewed interest in this concept has emerged and the condition is named under the general concept of cardiorenal syndrome [8].

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Disclosure Statement

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References

- 1 Eknayan G, De Santo NG. The enlightenment kidney-nephrology in and about the eighteenth century. *Semin Dial*. 2012 Jan-Feb;25(1):74–81.
- 2 Shoja MM, Tubbs RS, Loukas M, Shokouhi G, Ardalan MR. Marie-François Xavier Bichat (1771-1802) and his contributions to the foundations of pathological anatomy and modern medicine. *Ann Anat*. 2008 Nov;190(5):413–20.
- 3 Epstein M, Eknayan G. A forgotten chapter in the history of the renal circulation: the Josep Trueta and Homer Smith intellectual conflict. *Am J Physiol Renal Physiol*. 2015 Jul;309(2):F90–7.
- 4 Collet FJ. *Précis de pathologie interne*. Paris: Octave Doin; 1903. pp. 653–567.
- 5 Collet FJ. *Précis de pathologie interne*. Paris: Octave Doin; 1931. pp. 1087–90.
- 6 Osler W. *The principles and practice of medicine*. New York: Appleton; 1892.
- 7 Ayoub T, Chow J. The conventional autopsy in modern medicine. *J R Soc Med*. 2008 Apr;101(4):177–81.
- 8 Ronco C, Bellasi A, Di Lullo L. Cardiorenal syndrome: an overview. *Adv Chronic Kidney Dis*. 2018 Sep;25(5):382–90.