

# Reactive Arthritis in Ancient Egypt: A Possible Description in Medical Papyri

JAKUB KWIECINSKI, PhD, Department of Rheumatology and Inflammation Research, Sahlgrenska Academy at the University of Gothenburg, P.O. Box 480, 405-30, Gothenburg, Sweden. Supported by the Birgit and Gad Rausing Foundation for Humanistic Research. Address correspondence to Dr. Kwiecinski. E-mail: jakub.kwiecinski@rheuma.gu.se; jkwiecinski@gmail.com. J Rheumatol 2014;41:556–7; doi:10.3899/jrheum.131099.

Reactive arthritis (ReA) is a puzzling condition initiated by a genitourinary or gastrointestinal infection. Within 1–3 weeks after the triggering infection, the symptoms of ReA appear: joint inflammation, genitourinary symptoms (urethritis or cystitis), and eye inflammation, sometimes accompanied by enthesitis and sacroiliitis or dermatological changes<sup>1</sup>.

This unusual constellation of symptoms was described in the 19th century by Alexandre-Urbain Yvan, Benjamin Brodie, and Astley Cooper, and recognized as a separate disease in the 20th century by researchers Adolf Vossius, Noël Fiessinger, Edgar Leroy, and the infamous Nazi physician Hans Reiter<sup>1,2,3,4</sup>. This late identification of ReA might suggest that it is a recent disease, caused by changed properties of microbes or newly developed immune responses. But this is probably not true. Cases resembling ReA appear in many texts starting from the 16th century, as well as in individual writings from ancient Rome and Greece<sup>3</sup>. And ReA is probably even older: I draw attention to an ancient Egyptian text describing symptoms strikingly resembling ReA — likely the very earliest description of this disease.

A papyrus called Chester Beatty VI (named after Alfred Chester Beatty, who donated a papyri collection to the British Museum) was written in ancient Egypt during the 19th Dynasty, around 1200 BC<sup>5</sup>. Like other medical papyri of that time, it was probably used as a manual or a reference for ancient physicians. It contains descriptions of various diseases, among them this case (paragraph 13):

If it [i.e., the disease] manifests like an influence of a *bnw*-illness on the bladder and a *stt*-pathogenic factor on his [synovial?] joints, while he sends forth water between his buttocks, his body parts are burdened with fever and suffering, his urine has run away, his walking is painful, his pelvis is heavy, there is no end to his discharges, [then] you have to say concerning him: This is a heaviness of his rectum, an ailment I will treat.

Symptoms described in this text could be grouped into the following categories: (1) diarrhea: water flowing from between the buttocks gives an unmistakable impression of a severe diarrhea and intestinal infection; (2) arthritis: in ancient Egyptian thought, the pathogenic factor *stt* (misspelled in the papyrus as “*snktw*”<sup>6</sup>) was an animate factor flowing around the body and causing painful

symptoms in various organs<sup>7</sup>; therefore, *stt* in joints indicates some kind of arthritis; notably, the word used in the papyrus for a joint (*r-cty*, literally “a mouth of the two body parts/a mouth of the joint,” perhaps metaphorically “a cavity of the joint”) perhaps refers specifically to a synovial joint<sup>8</sup>; joint inflammation and enthesitis fit also with the mentioned pain caused by walking; “heavy pelvis” might refer to sacroiliitis (unless it refers to the diarrhea); and (3) urinary symptoms: the obscure symptom affecting the urinary bladder, *bnw*, linked with blood and pus in other Egyptian texts<sup>9</sup>, is perhaps a variant spelling of *bnwt*<sup>6</sup>, a term with an unspecific meaning of “tumor, boil, ulcer, sore, abscess”<sup>6,9</sup>; what is meant by this “bladder abscess” is clarified by another symptom: the “urine running away” (probably a frequent urination/a urinary incontinence, or the opposite — a reduced output of urine). The picture is completed by penile discharges (unless “discharges” refer to the diarrhea).

Identification of diseases in historical records is problematic. Disease manifestations might have changed over the centuries, records might be incomplete, symptoms of different diseases might have been merged, or some symptoms might have been considered normal or belonging to separate conditions. Ancient authors might have modified their accounts to better fit the medical theories prevalent at their time<sup>10</sup>. Nevertheless, sometimes one could attempt such a diagnosis. Because ancient Egyptians were the first in history to record their medical knowledge, analysis of their writings might provide a unique opportunity to explore the antiquity of diseases.

The complaints described in paragraph 13 of the Chester Beatty VI bear striking resemblance to ReA. Arthritis accompanied by genitourinary symptoms following intestinal infection is a highly characteristic and specific manifestation of this disease. The papyrus does not mention ocular and dermatological symptoms, but those are less common, frequently transitory, and might be missed by the patient<sup>1</sup>.

One problematic feature of the description is the apparent presence of the diarrhea at the same time as the arthritis. Symptoms of ReA could appear very quickly after the preceding infection, but usually there is some time interval. So why is this delay not mentioned? Maybe all the

symptoms were lumped together, without mentioning the order in which they appeared. Perhaps the author intended to describe a “correct” case of the disease, and did not mention the symptom-free period because it appeared illogical to him. Considering frequent gastrointestinal infections in ancient Egypt, maybe a new infection could trigger or exacerbate ReA induced by a previous infectious episode. This would give a false appearance of diarrhea at the same time as joint inflammation. Finally, we cannot exclude that we face an “extinct” disease that disappeared since ancient times. Another possibility is that the papyrus combined various diseases into 1 description. Whichever explanation seems most likely, no other modern condition has the characteristic mixture of intestinal symptoms, arthritis, and urinary symptoms that fits the description given in paragraph 13 of Chester Beatty VI. It is impossible to be certain, but ReA is the most reasonable identification. Apparently this bizarre condition is not due to any recent developments in microbial pathogenicity or human immune responses. It has troubled humans since the beginning of history.

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