

## Letter

### Famous Artists Who Suffer(ed) From Rheumatic Diseases: A Systematic Review

To the Editor:

Rheumatic diseases (RD) occur at a relatively high frequency in the population. We hypothesize that some of these diseases may have affected some artists and possibly influenced their works. In this article, a systematic review of all studies that described the occurrence of rheumatic diseases in famous artists in the world was performed. A PEO format (P = population, E = exposure, O = outcome) to elaborate the research question, "Famous artists (P), with rheumatic diseases (E), have their works changed (O) due to these diseases?" was used.

An extensive literature search in Pubmed/MEDLINE, Scielo, and LILACS, following the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines, was performed without language restriction, from 1965 to June 2020. After the review of titles and abstracts, 116 out of 1026 articles were selected for reading the full texts, of which 68 were selected for this review. We have identified 20 famous artists who had RD. Table 1 is a summary of all data regarding the artists<sup>1-20</sup>. Most of them had rheumatoid arthritis (RA) as a confirmed or presumptive diagnosis (n = 8), followed by gout (n = 3), systemic sclerosis (SSc; n = 2), reactive arthritis (n = 2), juvenile idiopathic arthritis (n = 1), ankylosing spondylitis (AS; n = 1), fibromyalgia (FM; n = 1), pycnodysostosis (n = 1), pustulotic arthro-osteitis syndrome (n = 1), and Susac syndrome (n = 1). Of note, some artists had 2 or more potential diagnoses: Lisboa ("Aleijadinho") with syphilis, leprosy, RA, or porphyria cutanea tarda; Rubens with gout; and Joyce with AS.

A confirmed diagnosis was verified in 8 of 20 and a presumptive diagnosis in 11 of 20. All of them continued to perform their artistic activities despite the limitations secondary to RD. Importantly, most (n = 15/20) of these artists had an art style change after the beginning of the RD. For only one (1/20) artist (Michelangelo), the RD seemed to not interfere with his artistic abilities, and for 4/20 (Aleijadinho, Barrie Cook, Benvenuto Cellini, and Erasmus of Rotterdam), we do not have information regarding this aspect. Further, artists with RA had polyarthritis (n = 5/8) and some of them had extraarticular manifestations (n = 3/8). Frida Kahlo had a medical history that was tragic and complex, including scoliosis, poliomyelitis, spina bifida, and multiple fractures after a car accident (needing more than 30 surgeries). These diagnostic hypotheses of postpoliomyelitis and posttraumatic FM also need to be considered<sup>21</sup>. One artist (Michelangelo) had probable saturnine gout secondary to lead paint exposure. Reactive arthritis was seen in 2 artists; they had suspected sexual contact as well as ocular inflammation followed by arthritis. SSc was a presumptive diagnosis for Aleijadinho, who had phalanx amputations. Treatments varied from nonpharmacological therapies such as diets (n = 3), spas (n = 4), exercises/physical therapy (n = 4), surgeries (n = 2), occupational therapy (n = 2), synoviorrhesis with yttrium (n = 1) and use of antiinflammatory drugs (n = 5), cortisone (n = 2), methotrexate (n = 1), antimalarials (n = 1), gold (n = 2), colchicine (n = 1), homeopathy (n = 2), and biologicals (n = 1).

Of note, RD in other artists were reported by Appelboom<sup>18</sup>, but articles were not found about them in our literature review. These artists are Marquise de Sevigné (writer, probable RA), Samuel Johnson (writer, gout), Mozart (composer, rheumatic fever), Niccolò Paganini (composer and violinist, Marfan or Ehlers-Danlos), Paul Scarron (poet, AS), Paul Verlaine (poet, knee arthritis), and Flannery O'Connor (writer, systemic lupus erythematosus).

A possible explanation for RA being the most frequent RD in these patients is that the occupational exposure to the color inks as well as

heavy smoking may have had a role in the development of RA in Renoir, Jawlensky, Niki, and Dufy. In addition, vapor from smoking contains several heavy metals such as cadmium. Metals are used in ink composition, such as in chrome yellow, molybdenum orange, and cadmium red; iron black and copper-zinc alloy powder (gold bronze) are used in novel silver and gold inks.

It has been reported that mercury, as well as gold, induces autoimmunity in genetically susceptible animals. Delayed hypersensitivity to metals was already evaluated in patients with RA, and significant amounts of mercury, titanium, and palladium were observed in these patients.

Rubens, Renoir, Dufy, and Klee used significantly brighter and clearer colors based on toxic heavy metals, and fewer earth colors containing harmless iron and carbon compounds. There is evidence of occupational exposure to cadmium by Barrie Cook. Another relevant risk factor for the development of RD is vitamin D deficiency. For those people who work indoors, it is a concern, as many artistic activities are developed in an indoor environment.

When we discovered that the majority of the artists that had RD changed their style due to their rheumatic conditions, we were able to conclude that there is a close relationship between disease and art<sup>22</sup>. In the same way that the pain and functional limitation caused by RD evoked sadness in these artists, that pain also provoked them to create beauty in their artistic works. Therefore, these diseases may be considered a "therapeutic method"<sup>22</sup>. We must remember that the arts are a way of expressing deep feelings, including suffering.

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Table 1. Summary of famous artists and their rheumatic diseases, clinical features, treatments used, and art style changes.

Artist (Birth–Death), Specialization, Country of Birth	Age at Disease Onset, yrs	Confirmed (CD) or Presumptive Diagnosis (PD)	Potential Differential Diagnosis (PDD)	Clinical Features	Treatment	Continued to Work After the Disease	Disease Changed the Artist's Style	Reference, First Author, Yr
Pierre-Auguste Renoir (1841–1919), painter and sculptor, France	25	RA (CD)	No PDD	<ul style="list-style-type: none"> <li>· Severe polyarticular synovitis, deformity on hands, feet, and coxofemoral joint</li> <li>· Fixed flexion of knees, destruction and ankylosis of his right shoulder, and ruptures in several extensor tendons of the hands</li> <li>· Extraarticular: rheumatoid nodules, pleural effusion, facial paralysis, rheumatoid cachexia, necrosis of the distal phalanges of the fifth finger (vasculitis)</li> </ul>	<ul style="list-style-type: none"> <li>· Thermal baths</li> <li>· Exercises</li> <li>· Devices of occupational therapy (orthesis)</li> <li>· Purgatives</li> <li>· Phenazone</li> </ul>	Yes	<ul style="list-style-type: none"> <li>· Yes</li> <li>· Small and rapid strokes</li> <li>· Invented the moving canvas or picture roll</li> <li>· More interest in the human body instead of landscapes</li> <li>· More vivid colors</li> </ul>	Mota, 2012 <sup>1</sup>
Peter Paul Rubens (1577–1640), painter, Germany	33	RA (PD)	Gout	<ul style="list-style-type: none"> <li>· Chronic involvement of feet, knees, and hands (symmetrical), complicated by flares</li> <li>· Extraarticular: pleuritis</li> </ul>	N/A	Yes	<ul style="list-style-type: none"> <li>· Yes</li> <li>· Represented joint alterations in his paintings</li> </ul>	Appelboom, 1981 <sup>2</sup>
Alexej von Jawlensky (1864–1941), painter, Russia	65	RA (CD)	No PDD	<ul style="list-style-type: none"> <li>· Feet, knee, ankles, jaw, shoulders, elbows, and cervical spine evolving to hand deformities</li> <li>· Complete immobilization due to cervical compression</li> <li>· Extraarticular: pleuritis, anemia and dry mouth (possible secondary Sjögren syndrome)</li> </ul>	<ul style="list-style-type: none"> <li>· Diet (vegetarian, raw food, no milk)</li> <li>· Physical therapy</li> <li>· Spas</li> <li>· Painkillers (pyramidone, phenacetin plus codeine)</li> <li>· Gold injections</li> <li>· Irradiations (deep radiograph, radium water drinks, radium compresses, and injections)</li> <li>· Injections of an unknown drug in and around joints</li> <li>· Alternative medicine (homeopathy, herbal medicine, iridology, radiesthesia, tooth extractions, bee venom ointment, spermine injections)</li> <li>· Blood transfusions to treat anemia</li> <li>· Raw meat plus hydrochloric acid</li> <li>· Injections of liver extract</li> </ul>	Yes	<ul style="list-style-type: none"> <li>· Yes</li> <li>· Broader and more carefree application of color and both darker and brighter appearance of the paints</li> <li>· Small-sized paintings</li> <li>· Restricted arm movements forced him to hold the brush with both hands and to move his entire upper body</li> <li>· Influence on a series of small meditations</li> </ul>	Zeidler, 2011 <sup>3</sup>
Raoul Dufy (1877–1953), painter, France	55	RA (CD)	No PDD	<ul style="list-style-type: none"> <li>· Polyarthrititis</li> <li>· ESR 33 mm/h</li> </ul>	<ul style="list-style-type: none"> <li>· ACTH</li> <li>· Cortisone</li> <li>· Gold</li> <li>· Aspirin</li> <li>· Physiotherapy</li> </ul>	Yes	<ul style="list-style-type: none"> <li>· Yes</li> <li>· Reduced size of paintings</li> <li>· Plots were less accurate and subjects were restricted to his imagination or what he could contemplate without moving</li> </ul>	Castillo-Ojugas, 1992 <sup>4</sup>

Table 1. Continued.

Artist (Birth–Death), Specialization, Country of Birth	Age at Disease Onset, yrs	Confirmed (CD) or Presumptive Diagnosis (PD)	Potential Differential Diagnosis (PDD)	Clinical Features	Treatment	Continued to Work After the Disease	Disease Changed the Artist's Style	Reference, First Author, Yr
							· Represented joint alterations in his late paintings · Entitled one of his most colorful canvases “La Cortisone”	
<b>Paul Klee</b> (1879–1940), painter and poet, Switzerland	55	SSc after measles or heavy metal toxicity (CD)	No PDD	· Raynaud phenomenon · Skin alterations with contractures and ulcerations · Fatigue, exhaustion, dysphagia, weight loss, dyspnea · Arthritic pain, disability, difficulty in holding paintbrushes · Heart failure	· Medical recommendation of stopping smoking and visit a spa to improve his well-being · Medical records were destroyed by a fire at the hospital after his death · There is no indication either of how his illness was managed	Yes	· Yes · Simplicity, more intensity, and use of rough materials (e.g., burlap and newspaper) · More somber and contracted forms, drawing on black and brown · Broad brush strokes, heavy, black crayon-like lines, and dull colors · Paintings depicted agonies that he suffered · Titles that reflected fear, suffering, death, and war	Suter, 2014 <sup>5</sup>
<b>Antoni Gaudí</b> i Cornet (1852–1926), architect, Spain	66	Juvenile RA (PD)	Rheumatic fever	· Arthralgia, mainly involving the ankles · Difficulty walking during disease flare	· Vegetarian diet, plenty of liquid · Homeopathic therapy · Spa	Yes	· Yes · Influenced his observational power and nature analysis	da Mota, 2012 <sup>6</sup>
<b>Manolo Hugué</b> (1872–1945), painter and sculptor, Spain	55	RA (CD)		· Polyarthritits · Deformity of fingers	· Diathermia · Physical therapy	Yes	· Yes · Partially abandoned sculpture and devoted himself to painting and poetry	Pou, 2011 <sup>7</sup>
<b>Antônio Francisco Lisboa “Aleijadinho”</b> (1730–1814), sculptor and architect, Brazil	47	SSc (PD)	· Syphilis · Leprosy · RA · Porphyria cutanea tarda	· Progressive disabling disease with hand deformity (phalanx amputations) · Paraplegy · Paraparesis	N/A	Yes	N/A	Azevedo, 2008 <sup>8</sup>
<b>Max Slevogt</b> (1868–1932), painter, Germany	27	Gout (CD)	No PDD	Arthritis (feet and knees)	· Bed rest · Colchicine, iodite, aminofenazone, potassium ointment · Vegetarian diet, other dietary measures · Multiple spa treatments	Yes	· Yes · Many of his attacks of gouty arthritis are illustrated in drawings that document involvement of feet and knees	Zeidler, 2020 <sup>9</sup>
<b>Michelangelo</b> di Lodovico Buonarroti Simoni (1475–1564), painter, sculptor, poet, and architect, Italy	80	Gout (PD)	· Osteoarthritis · Saturnine gout · Deficiency of hypoxanthine-guanine phosphoribosyl transferase	· Arthritis, tophi · Urinary stones (uric acid) · Changes in the first carpometacarpal joint · Difficulty writing · Depression (or bipolar manic-depressive illness)	N/A	Yes	· Probably not · His articular illness seems to have had little effect on his artistic productivity · Some of his paintings mirror his depression as seen in “Jeremiah in the Sistine Chapel”	Pinals, 2015 <sup>10</sup>

Table 1. Continued.

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<b>James Augustine Aloysius Joyce</b> (1882–1941), poet and writer, Ireland	23	ReA or AS (PD)	No PDD	· Recurrent iritis and oligo/polyarthritis · Frequented prostitutes several times	· Dental treatment · Iridectomy and iridectomy · 8 ocular surgeries · Poor adhesion to treatments	Yes	· Yes · Written works abound with references to doctors, symptoms, and diseases of all kinds	Ventura, 2008 <sup>11</sup>
<b>Barrie Cook</b> (1929–), painter, UK	44	RA after chronic cadmium exposure from paint and smoking (CD)	No PDD	· RF 149 IU/mL · anti-CCP > 500 U/mL	Multiple biologicals	Yes	N/A	Cates, 2016 <sup>12</sup>
<b>Benvenuto Cellini</b> (1500–1571), sculptor and writer, Italy	29	ReA (PD)	· Syphilis · Malaria	· Painful ocular inflammation · Skin rash · Chronic arthritis · Back pain · History of suspected sexual contact	· <i>Lignum vitae</i> · Mercury (reported to cure syphilis)	Yes	N/A	Anderson, 1989 <sup>13</sup>
<b>Albrecht Dürer</b> (1471–1528), painter, Germany	20	RA (PD)	No PDD	Joint swelling and deformity	N/A	Yes	· Possibly · Discovered own individuality and introduced his portraiture biography into German arts · Polyarthritis did not necessarily interfere with his artistic activities	Weisz, 2007 <sup>14</sup>
Jean-Baptiste-Camille <b>Corot</b> (1796–1875), painter, France	70	Gout (PD)	No PDD	· Podagra; arthritis of right foot or both feet · Walking was affected	N/A	Yes	· Possibly · Portrayed specific anatomic abnormalities in his work (e.g., the hand of the “Gypsy Girl”) representing gout/arthritis	Panush, 1990 <sup>15</sup>
<b>Niki de Saint Phalle</b> (1930–2002), painter and sculptor, France	50	RA (CD)	No PDD	· Erosive RA · Positive RF · Also suffered from various other diseases: depression, chronic lung disease attributed to polystyrene exposure, selective IgA deficiency	· Antimalarials · Prednisolone · Methotrexate · Synoviothesis with yttrium	Yes	· Yes · Reflected anger and violence after disease	Zeidler, 2013 <sup>16</sup>
<b>Frida Kahlo</b> (1907–1954), painter, Mexico	18	Posttraumatic fibromyalgia (PD)	· Spina bifida · Postpolio syndrome	· Chronic generalized pain and profound fatigue · Poliomyelitis · Injuries from vehicle accident with 30 orthopedic surgeries; back pain started after accident at 18 yrs	· Painkillers · Orthopedic devices · Metal and plaster corset · Surgeries	Yes	· Yes · Work is completely influenced by her diseases · Anguish and pain are common themes · Work reflected both anger and violence as a product of her suffering	Courtney, 2017 <sup>17</sup>
<b>Henri de Toulouse-Lautrec</b> (1864–1901), painter, France	Birth	Pycnodysostosis (PD)	· Osteogenesis imperfecta · Achondroplasia · Polyepiphyseal dysplasia	· Shortness of stature · Bone brittleness (fractures in both legs from minor trauma during his childhood) · Shortness of hands · Craniofacial deformity with absence of knitting of the fontanel and autosomal recessive transmission	N/A	Yes	· Yes · Physical appearance limitations deeply influenced his artwork · Used art as a way to fully express his repressed energy	Appelboom, 1989 <sup>18</sup>

Table 1. Continued.

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<b>Erasmus of Rotterdam</b> (1466–1536), philosopher and scholar, the Netherlands	32	Pustulotic arthro-osteitis syndrome (PD)	· Gout · Syphilitic arthritis · Enteric rheumatism	· Periods of malaise, of gastrointestinal disturbances, fever with systemic manifestations, spine problems suggestive of spondylitis, pustulotic skin problems suggestive of vasculitis, joint problems typical of arthritis, and chronic osteitis · Retroperitoneal fibrosis (secondary to longstanding inflammatory process)	N/A	Yes	N/A	Dequeker, 1991 <sup>19</sup>
<b>Francisco Jose de Goya y Lucientes</b> (1746–1828), painter, Spain	47	Susac syndrome	· Syphilis · Malaria · Measles · Vogt-Koyanagi-Harada disease · Vasculitis · Plumbism · Cinchonism · Cerebral arteriosclerosis · Mumps encephalitis · Cogan syndrome	· “Noises in his head,” and then total deafness · Impairment of vision, difficulty maintaining his balance · Eventually recovered his faculties, including his eyesight	· Electric therapy attempt · Sign language	Yes	· Yes · Turned from the pastoral to the horrific · Most importantly, he began to draw everyday scenes, from life or from memory · One effect of Goya's deafness on his art was to stimulate him to experiment with new themes and subjects in noncommissioned work	Hertzano, 2019 <sup>20</sup>

Names in bold are those in which the artist is best known. ACTH: adrenocorticotropic hormone; anti-CCP: anticyclic citrullinated peptide antibodies; AS: ankylosing spondylitis; ESR: erythrocyte sedimentation rate; N/A: not available; RA: rheumatoid arthritis; ReA: reactive arthritis; RF: rheumatoid factor; SSc: systemic sclerosis.

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