**Suppl 1.** Review of Reported Listeria Infections Under Biological Drugs

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| **Px** | **Authors** | **Origin (year)** | **Age group** | **Product and no. of doses** | **Indication** | **Concomitant immunosuppressant/immunomodulator drugs** | **Type of infection** | **Outcome** |
| 1 | Abreu, C., Magro, F., Vilas-Boas, F., Lopes, S., Macedo, G. and Sarmento, A. [2] | Portugal(2013) | 51F  | Infliximab (x2 infusions) | UC | Steroids | *L. monocytogenes* meningitis  | Managed with ampicillin & meropenem; recovered; nil adverse clinical or neurological sequelae; asymptomatic on 5-ASA maintenance therapy; infliximab was not reintroduced |
| 2 | 69M | Infliximab (x2 infusions) | UC | Steroids, azathioprine | *L. monocytogenes* meningitis | Received 3-week course of ampicillin & gentamicin for first week; recovered with no clinical or neurological sequelae; infliximab reintroduced 4 months after completing meningitis treatment |
| 3 | Parihar V, Maguire S, Shahin A, Ahmed Z, O’Sullivan M, Kennedy M et al. [8] | Ireland(2015) | 37M  | Infliximab (x1 infusion)10 days after receiving first infusion of infliximab | UC | Steroids | *L. monocytogenes* meningitis  | Steroids suspended; prescribed 10-day course of IV amoxicillin and gentamicin. Recovered with no neurological sequelae. Subtotal colectomy was eventually performed with no further anti-TNFa therapy. |
| 4 | Inoue T, Itani T, Inomata N, Hara K, Takimoto I, Iseki S et al. [9] | Japan (2017) | 80M  | Not initiated on infliximab | UC | A1: PO prednisolone 20 mg/day added to 5-ASA maintenanceA2: PO prednisolone 30 mg/day and azathioprine | *L. monocytogenes* septicemia caused by enteritis complicating UC and meningitis; *Candida* septicemia & pulmonary aspergilloma  | Treated with IV ampicillin (Listeria infection); gradually recovered with antifungal therapy (Candida infection); tazobactam/piperacillin added for empiric cover; required prolonged hospital stay; UC well-controlled - eventually treated with immunomodulator and 5-ASA maintenance but not steroids  |
| 5 | Rana F, Shaikh M, Bowles J. [10] | UK (2014)  | 75M  | Infliximab (x2 doses) | UC | Required recurrent courses of steroids for multiple flares, mercaptopurine | *L. monocytogenes* meningitis; hydrocephalus and elevated intracranial pressure | Required to be intubated and ventilated; ventricular drain inserted by neurosurgery service; patient gradually recovered and discharged home after protracted hospital stay  |
| 6 | Issa I, Eid A. [11] | Beirut, Lebanon (2013) | 59M  | Infliximab (x1 dose) | UC | Prednisolone 30 mg/day, azathioprine | *L. monocytogenes* meningitis  | Empiric treatment with ceftriaxone & vancomycin; later switched to ampicillin; deteriorated clinically and suffered cardiopulmonary arrest; passed away 14 days later due to multi-organ failure |
| 7 | 39M  | Infliximab (x1 dose) | UC | Prednisolone 40 mg/day, azathioprine | *L. monocytogenes* meningitis | Treated with 21-day course of ampicillin; completely recovered and infliximab never needed to be restarted  |
| 8 | Gray J, Allen P, Diong K, Kane M, Varghese A. [12] | Northern Ireland(2013) | 65M | Infliximab (x1 dose) | Crohn’s colitis | Corticosteroids, azathioprine  | *L. monocytogenes* bacteremia | As per paper, both patients had good response to intravenous amoxicillin |
| 9 | 50M | Infliximab | UC |
| 10 | Katsanos K, Kostapanos M, Zois C, Vagias I, Limberopoulos E, Christodoulou D et al. [13] | Greece (2010) | 76M  | Infliximab (x1 dose) | Left-sided UC | Corticosteroids (including methylprednisolone 24 mg)Azathioprine | *L. monocytogenes* bacteremia  | Treated with garamycin & ampicillin; started on empiric tazobactam/piperacillin (Tazocin); methylprednisolone dose decreased to 18 mg; was well on discharge and team considered to restart patient on anti-TNF agent |
| 11 | Williams G, Khan A, Schweiger F. [14] | New Brunswick (2005) | 37M  | Infliximab (x2 infusions) | Severe Crohn’s colitis | Prednisolone 35 mg/day (as well as IV methylprednisolone)Azathioprine | *L. monocytogenes* meningitis  | Complete patient recovery with no adverse neurological sequelae; achieved remission with 4 grams of 5-ASA and 2.5 mg/kg/day of azathioprine  |
| 12 | Lamdhade SJ, Thussu A, Al Benwan KO and Alroughani R [15] | Kuwait (2013) | 28F  | Infliximab (x3 doses) |  | Prior immunosuppression and recent infliximab for UC; pregnancy confirmed at 2nd infliximab infusion | *L. monocytogenes* meningitis  | Managed with ampicillin and gentamicin; unfortunate spontaneous intrauterine death of fetus at 15 weeks’ gestation  |
| 13 | Rani U, Rana A. [16] | Syracuse, NY (2021) | 8F | Infliximab (x2 infusions) | CD | IV steroids | *L. monocytogenes* meningitis  | Started on ceftriaxone and vancomycin for empiric cover however changed to ampicillin and gentamicin once Listeriosis confirmed; tapering prednisolone regimen for CD; commenced on MTX 1 month after completing antibiotic regimen as parents wanted to avoid biological agents; however, relapse of GI symptoms occurred despite MTX treatment for 2 months; subsequently, she was started on Vedolizumab; at 6-month clinic follow-up tolerating Vedolizumab and MTX combination therapy well |
| 14 | Slifman N, Gershon S, Lee J, Edwards E, Braun M. [17] – table adopted and adapted from this paper | US | 67M | Infliximab (x3 doses) | CD | Prednisolone 40 mg once dailyAzathioprine | *L. monocytogenes* bacteremia | Recovery as per paper  |
| 15 | US | 17F | Infliximab (x1 dose)  | CD | MethylprednisoloneMercaptopurine | *L. monocytogenes* bacteremia; probable meningitis (CSF leucocytosis)  | Recovery as per paper  |
| 16 | US | 80M | Infliximab (x2 doses)  | RA | Prednisolone 15 mg once daily | *L. monocytogenes* bacteremia; meningitis  | Death |
| 17 | US | 74F | Infliximab (x6 doses)  | RA | Prednisolone 15 mg once dailyMTX 17.5 mg once weekly | *L. monocytogenes* meningitis  | Death |
| 18 | US  | 78M | Infliximab (x3 doses)  | RA | MTX 20 mg once weekly | *L. monocytogenes* meningitis  | In coma at time of report |
| 19 | US  | 73F | Infliximab (x2 doses)  | RA | PrednisoloneMTXMMF | *L. monocytogenes* bacteremia; possible meningitis  | Death; acute myocardial infarction and ventilator-related pneumonia followed closely by multi-organ failure |
| 20 | US | 74F | Infliximab (x5 doses)  | RA | Prednisolone 3 mg once dailyMTX 7.5 mg once weeklyHydroxychloroquine | *L. monocytogenes* bacteremia  | Recovery |
| 21 | US | 73M | Infliximab  | Not reported | PrednisoloneMTX 50 mg IMLeflunomide | *L. monocytogenes* meningitis  | Not reported  |
| 22 | Canada  | 64F | Infliximab (x1 dose)  | CD | Prednisolone 7.5-40 mg once dailyMercaptopurine | *L. monocytogenes* bacteremia | Recovery however died 4 months later due to unknown cause  |
| 23 | Sweden  | 39F | Infliximab (x3 doses)  | CD | Prednisolone 45 mg once dailyMercaptopurine | *L. monocytogenes* bacteremia; *meningitis* | Recovered however residual unilateral ocular palsy |
| 24 | Italy  | 20M | Infliximab (x1 dose) | CD | Methylprednisolone 100 mg once daily IV for 6 weeksAzathioprine | *L. monocytogenes* meningitis  | Death  |
| 25 | Germany  | 60F | Infliximab (x5 doses)  | RA | Prednisolone 20 mg once dailyMTX 15 mgCyclosporine | *L. monocytogenes* bacteremia; gallbladder infection  | Death; cerebral edema |
| 26 | Canada | 60M | Infliximab (x2 doses) | RA | MTX 20 mg once weekly | *L. monocytogenes* bacteremia | Recovery |
| 27 | France | F (age not reported) | Infliximab  | RA | Information not provided | *L. monocytogenes* septic arthritis  | Not recovered at time of report; continued Infliximab regimen |
| 28 | Norway  | 72M | Etanercept  | RA | PrednisoloneMTX 10 mg | *L. monocytogenes* bacteremia  | Death; acute coronary syndrome & sepsis |
| 29 | Power D, Jackson L, Murphy O, McCarthy J, Horgan M. [18] | Cork, Ireland  | 55F | Infliximab (x1 infusion)  | UC | Corticosteroids | Pneumocytis pneumonia *Listeria monocytogenes* meningitis  | Received extended course IV amoxicillin for Listeriosis; bronchoalveolar lavage confirmed Pneumocystis pneumonia; initiated dapsone 100mg OD and corticosteroids for concomitant infections; patient had a good clinical outcome |
| 30 | Koklu H, Kahramanoglu Aksoy E, Ozturk O, Gocmen R, Koklu S. [19] | Turkey  | 60F | Not initiated on infliximab | UC | Prednisolone 25 mg once dailyAzathioprine 100 mg once daily | *L. monocytogenes* in CSF cultureLeft thalamo-mesencephalic abscess  | Prednisolone dose gradually reduced;meropenem & ampicillin administered for CNS infection; meropenem switched to gentamicin, and gentamicin & ampicillin was continued for 1 month; patient clinically improved; control cranial MRI in 6th week showed marked improvement; discharged from hospital on 4 g/day mesalamine  |
| 31 | Lee J, Song H, Boo S, Na S, Kim H. [20] | Korea  | 75F | Infliximab (x1 dose)  | Left-sided UC | Prednisolone | *L. monocytogenes* sepsis  | Full recovery after 21-day treatment of IV ampicillin and gentamicin |
| 32 | Reilly E, Hwang J. [21] | USA  | 61F | Lenalidomide (one of the mechanisms of action is TNF inhibition)  | Multiple myeloma | Not on any immunosuppressants | Listeria cerebritis with bacteremia | Patient passed away on day 17 of admission  |
| 33 | Tsuchiya A, Terai S. [22] | Japan  | 62F | Infliximab 5 mg/kg every 8 weeks | UC | Mercaptopurine | Listeria colitis progressing to septicemia and meningitis  | Ampicillin 12 g/day started; symptoms improved with prolonged 79 day course of antibiotics  |
| 34 | Stratton L, Caddy G. [23] | UK  | 69M  | Infliximab (x1 dose) *3 days after commencing infliximab*  | CD | 5-ASA & Azathioprine failed to achieve remission; steroid-dependent (continuous prednisolone for 7 months prior to admission) | Listeria rhombencephalitis  | Deemed unsuitable for surgery; no signs of neurological recovery; repeated episodes of aspiration pneumonia; death 10 months following first infliximab dose  |
| 35 | Atsawarungruangkit A, Dominguez F, Borda G, Mavrogiorgos N. [24] | USA  | 45F  | Adalimumab *Presented 17 days after initiation* | CD | PO prednisolone daily and PO mercaptopurine | *L. monocytogenes* brain abscess  | Discharged on day 7 with ampicillin 2 g IV every 4 h for total of 2 weeks; received additional week of trimethoprim/sulfamethoxazole after 3 weeks of ampicillin; repeat MRI performed 4 weeks after initial treatment showed no evidence of ring enhancing lesion  |
| 36 | Bowie V, Snella K, Gopalachar A, Bharadwaj P. [25] | USA  | 73M  | Infliximab (x2 doses) | RA | Concomitant immunosuppression; chronic steroid use | Listeria meningitis  | Received 21 days of antibiotic and recovered without any complications |
| 37 | Kesteman T, Yombi J, Gigi J, Durez P. [26] | Belgium  | 2 cases | Infliximab (x3 doses)  | RA | Glucocorticoids Methotrexate Infliximab | *L. monocytogenes* sepsis; terminal ileitis; bacteremia | Recovered with intravenous sulfamethoxazole-trimethoprim and gentamicin (total duration 30 days antimicrobials). |
| 38 | Glucocorticoids Methotrexate Infliximab | *L. monocytogenes* sepsis; bacteremia associated with prosthetic joint arthritis of left hip | Managed with conservative treatment as patient was not a candidate for removal of prosthesis.Surgical arthrocentesis performed with long term antibiotic course of amoxicillin. Progressively recovered on follow up. |
| 39 | Horigome R, Sato H, Honma T, Terai S. [27] | Japan  | 2 cases | Adalimumab; Golimumab | UC | 5-ASA Prednisolone Infliximab (later switched to Adalimumab) | Septicemic listeriosis | Ampicillin commenced. Continued IBD management with immunomodulators and adalimumab with no progression of pan colitis.  |
| 40 | Mesalazine Prednisolone Mercaptopurine Golimumab | Ampicillin commenced. Continued IBD management with golimumab with no further recurrence of UC. |
| 41 | Chuang M, Singh J, Ashouri N, Katz M, Arrieta A. [28] | USA | 17M  | Infliximab (x1 dose)  | UC | Prednisolone 40 mg BD for 2 weeks followed by 30 mg BD for 6 weeksMercaptopurine 75 mg daily for 3 weeks | Listeria meningitis | Required pediatric ICU admission where he required volume support for shock; discharged home on day 15 of admission with plan to complete 21-day course of meropenem, gentamicin and rifampin (amoxicillin allergy) |
| 42 | Boland B, Dulai P, Chang M, Sandborn W, Levesque B. [29] | USA  | 19F | Vedolizumab*Presented to ED 10 days after first infusion*  | CD | Ongoing symptoms despite Certolizumab pegol, Azathioprine and budesonide; certolizumab discontinued and Vedolizumab administered; Azathioprine and budesonide continued | Pseudomonas meningitis  | Treated with cefepime and recovered; eventually vedolizumab was resumed without azathioprine along with tapering course of prednisolone  |
| 43 | Kubota T, Mori Y, Yamada G, Cammack I, Shinohara T, Matsuzaka S et al. [30] | Japan  | 73M  | Adalimumab 40 mg every 2 weeks for 7 months | RA | Methylprednisolone 8 mg/dayIguratimod 50 mg/dayDiet comprised on a daily basis of pasteurized milk and cheese; only common raw foods - vegetables and fish consumed in Japan  | *L. monocytogenes* ankle osteomyelitis  | IV ampicillin and gentamicin initiated; affected bone resected on day 24 and cement fixation was performed; required 2nd operation on day 143 to remove cement and transplant autogenous iliac bone graft as substitute; slow but complete recovery, and gait returned to normal pattern [gentamicin duration 16 days, ampicillin duration 66 days] |
| 44 | Kelesidis T, Salhotra A, Fleisher J, Uslan D. [31] | USA | 42F | Infliximab (received 5 monthly infusions of infliximab 5 mg/kg) | PA | Prior to initiation of infliximab – treated with MTX, etanercept and adalimumab (incomplete clearance of skin lesions and persistent arthralgias) | Listeria endocarditis  | Recovered with IV high-dose ampicillin, discharged on 6-week course of antibiotics  |

UC: ulcerative colitis; CD: Crohn’s disease; RA: rheumatoid arthritis; PA: psoriatic arthritis; A1: admission 1; A2: admission 2; MTX: methotrexate; MMF: mycophenolate mofetil.

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