Long-term safety and efficacy of deferasirox in patients with myelodysplastic syndrome, aplastic anemia and other rare anemia in Taiwan

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\textbf{ABSTRACT}

\textbf{Objective:} Patients with myelodysplastic syndromes (MDS), aplastic anemia (AA) or other rare anemia require chronic blood transfusions which can lead to iron overload and subsequent excess iron-mediated complications. Intensive iron chelation with deferasirox could remove excess iron and can alleviate these events; however, the long-term safety and efficacy in Chinese population are not clearly characterized. This study examined the long-term efficacy and safety of deferasirox in a real-world setting in Taiwan.

\textbf{Methods:} This observational, non-interventional, single-arm, multi-center, phase IV study was designed to collect the safety and clinical information about patients who were treated with deferasirox according to investigator’s judgment and in accordance with the general clinical practice.

\textbf{Results:} From 2009 to 2011, patients with MDS (N = 38), AA (N = 23), and other rare anemias (N = 18) were enrolled. The mean deferasirox exposure was 17.7 ± 4.02 mg/kg/day. The most common drug-related AEs were skin disorders (32.9%) and gastrointestinal disorders (30.4%), while grade 3–4 AEs were rare (5.1%). In the overall patient population, deferasirox effectively decreased serum ferritin levels at 1 year (P = 0.0154) and 3 years (P = 0.0424) from the baseline. Upon the use of deferasirox, 32.9% patients showed erythroid response and 16.7% patients had platelet response.

\textbf{Conclusions:} For patients with MDS, AA, and other rare anemias, the AEs observed in this 3-year surveillance study with deferasirox were mostly mild or moderate. In addition, the hematological response rate was higher than that in the EPIC study, which primarily enrolled Caucasian patients.

\textbf{Introduction}

Chronic blood transfusions can lead to iron overload, which may cause significant end organ damage including heart, liver and endocrine glands, and is negatively associated with survival. Regular red blood cell (RBC) transfusion, a corner stone of supportive care among patients with rare anemias [1], is required in about ~90% of myelodysplastic syndromes (MDS) [2] and in more than 30% of patients with Diamond–Blackfan anemia [3], and is crucial for the treatment of aplastic anemia (AA) [4].

Intensive iron chelation therapy (ICT) to remove excess iron could be beneficial to alleviate complications due to iron overload in patients with chronic transfusion-dependent anemias. Deferoxamine established the concept of iron chelation with its long-term efficacy and with its potential in limiting the organ damage and to increase the life expectancy in patients with thalassemia major [5]. However, the parenteral or subcutaneous administrations with cumbersome infusion schedules (8–12 h infusion at a dose of 40–50 mg/kg/day) and toxic side effects such as auditory, ocular, and neurotoxic abnormalities limit its use in clinical practice. Deferiprone is an alternative to deferoxamine for patients who cannot tolerate deferoxamine or in cases of treatment failure [6]. However, deferiprone has not been licensed by the Taiwan Food and Drug Administration for use in patients with MDS [7].

Deferasirox, another orally active chelator, has been demonstrated as generally well-tolerated and effective compared with deferoxamine among patients with chronic transfusions. Evidence from clinical trials and post market surveillance performed to date reveal that deferasirox is well-tolerated and effective in...
patients with iron overload due to chronic blood transfusions [8–18].

Previous studies, including a local Taiwanese trial focused largely on administration of deferasirox in thalassemia major [18,19]. However, among patients with diseases other than thalassemia major, who require chronic transfusions, the safety and efficacy of deferasirox has not been evaluated in the patient population from Taiwan. Therefore, we conducted this observational study, which aimed to evaluate the long-term safety and efficacy of deferasirox in patients with MDS, AA, and other rare anemia in Taiwan.

Methods

Study design

This observational, non-interventional, single-arm, multi-center, phase IV study was conducted in 11 centers in Taiwan. The study was designed to collect the safety and clinical information about patients who were treated with deferasirox according to investigator’s judgment and in accordance with the general clinical practice. Patients were recruited from August, 2009 to June, 2011. A run-in period of a maximum of 28 days and a 3-year follow-up observational period were scheduled.

All patients were required to provide a written informed consent. The study protocol and amendments were reviewed by an ethics committee and institutional review board at each participating center, and the study complied with the latest Declaration of Helsinki, Good Clinical Practices, and Good Post-Marketing Study Practices.

Patients

Patients eligible for this study included those with history of transfusion and the diagnosis of low-risk MDS (including refractory anemia with or without ringed sideroblasts; refractory cytopenia with multilineage dysplasia; refractory sideroblastic cytopenia with multilineage dysplasia; 5q-syndrome, or unclassified myelodysplasia according to WHO classifications; OR MDS with low or intermediate-I risk categories according to the International Prognostic Scoring System (IPSS)), AA, or other rare types of anemia (including anemias caused by other underlying conditions) requiring chronic transfusion. Chronic iron overload, as determined by elevated serum ferritin levels (level justified by investigator for MDS and AA, and >2000 μg/L for patients with other rare anemias) are also required for the enrollment into this study.

Exclusion criteria included estimated serum creatinine >1.5 times the age matched institutional ULN (upper limit of the normal); mean levels of alanine aminotransferase (ALT) >5 times institutional ULN; previous use of deferasirox as an iron chelator; chronic anemia related to anti-leukemia or cancer therapy; Refractory Anemia with Excess Blasts (RAEB)-1 or 2 according to WHO classification, or intermediate-2 or high IPSS risk MDS; other acute or chronic leukemia of any type; any other medical history deemed inappropriate for inclusion or completion for this study as judged by investigator; significant and active gastric medical conditions or gastrointestinal (GI) tract surgery; females of child-bearing potential or breastfeeding; a history of non-compliance to medical regimens and patients who were considered potentially unreliable and/or not cooperative; life expectancy <1 year; or patients aged <12 years of age.

Study assessments

The primary assessment was to evaluate the long-term safety of deferasirox over 3 years in patients with MDS, AA, and other rare anemias under conditions of general clinical practice. The secondary assessment included the determination of the deferasirox efficacy as an ICT through changes in serum ferritin levels compared with baseline, hematological responses, correlations between the hematologic response and disease groups/initial dose/dose intensity of deferasirox, and overall survival (censored at 3 years). The International Working Group (IWG) 2006 criteria were used to assess erythroid and platelet responses during deferasirox treatment. Only patients with pretreatment hemoglobin (Hb) levels <11 g/dL were included for evaluation of erythroid response. Erythroid response was defined as an increase in Hb ≥1.5 g/dL or a reduction in transfusion requirements (reduction of ≥4 RBC transfusions/8 weeks compared with pre-treatment transfusions; RBC transfusions given only for patients with a Hb ≤9.0 g/dL). Patients with pre-treatment platelet counts <100×10^9/L were included for evaluation of platelet response. Platelet response was defined as an increase of ≥30×10^9/L for patients having >20×10^9/L platelets at baseline or an increase from <20×10^9/L to >20×10^9/L and by ≥100%.

Statistical analysis

The sample size calculations were not formally performed due to the exploratory nature of this post-marketing study. It was expected to enroll 100–150 patients based on the number of patients diagnosed with MDS, AA, or other rare anemia requiring chronic blood transfusion, and who were at risk for transfusion-related iron overload. The assessments of safety were based mainly on the frequency of all adverse events (AEs) and serious AEs (SAEs). All AEs were summarized with coding term, severity and relationship to the study drug by frequency tables with the counts and percentage. Descriptive statistics were summarized for
all safety continuous parameters and change from the baseline values. The statistical significance was tested by a paired t test for the change from the baseline values. The time to event data (overall survival censored at 3 years) were analyzed by the Kaplan-Meier survival method.

**Results**

**Patient disposition and demographics**

Of the 79 patients enrolled in this study, 38 (48.1%) patients had MDS, 23 (29.1%) had AA, and 18 (22.8%) had other rare anemia. Fifty-six (70.9%) patients

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**Table 1. Patient demographics and baseline characteristics.**

| Status                        | MDS N = 38 | AA N = 23 | Other rare anemia* N = 18 | Total N = 79 |
|-------------------------------|------------|-----------|---------------------------|--------------|
| Gender, n (%)                 |            |           |                           |              |
| Male                          | 22 (57.9)  | 14 (60.9) | 11 (61.1)                 | 47 (59.5)    |
| Female                        | 16 (42.1)  | 9 (39.1)  | 7 (38.9)                  | 32 (40.5)    |
| Age (years)                   | 68.3 (15.2)| 53.1 (17.1)| 70.4 (18.3)               | 64.3 (17.8)  |
| Weight (kg)                   | 61 (9.4)   | 65.5 (14) | 52.9 (12.5)               | 60.5 (12.3)  |
| KPS (%)                       | 81.4 (8.8) | 81.4 (13.1)| 80 (12.7)                 | 81.1 (11)    |
| Anemia related history        |            |           |                           |              |
| Duration of disease (years)   | 1.8 (2.4)  | 4.4 (6.4) | 4.5 (5.0)                 | 3.2 (4.6)    |
| Duration of transfusion history (years) | 1.8 (2.1)  | 2.8 (3.9) | 4.5 (5.2)                 | 2.7 (3.7)    |
| No. of transfusions during the last year | 16.1 (20.3) | 148 (6.8) | 109 (6.4)                 | 145 (14.6)   |
| Last transfusion amount prior to study (c.c) | 379 (127)  | 346 (105) | 350 (115)                 | 362 (118)    |
| Hb prior to transfusion (grams/dL) | 7.0 (1.5)  | 6.9 (1.2) | 7.6 (1.1)                 | 7.1 (1.4)    |
| Previous iron chelation therapy, n (%) | 1 (2.6)    | 2 (8.7)   | 1 (5.6)                   | 4 (5.1)      |
| Deferoxamine                  | 1 (2.6)    | 0 (0)     | 0 (0)                     | 1 (1.3)      |
| Deferiprone                   | 1 (2.6)    | 0 (0)     | 0 (0)                     | 1 (1.3)      |
| None                          | 36 (94.7)  | 21 (91.3) | 17 (94.4)                 | 74 (93.7)    |
| Serum ferritin level          | 2330 (1470)| 3350 (1470)| 3980 (3290)               | 3000 (2120)  |
| Serum ferritin level [ng/mL, n (%)] |            |           |                           |              |
| <1000                         | 2 (5.3)    | 0 (0)     | 0 (0)                     | 2 (2.5)      |
| 1000—<2500                    | 23 (60.5)  | 8 (34.8)  | 6 (33.3)                  | 37 (46.8)    |
| 2500—<4000                    | 8 (21.1)   | 8 (34.8)  | 7 (38.9)                  | 23 (29.1)    |
| 4000—<5500                    | 4 (10.5)   | 5 (21.7)  | 2 (11.1)                  | 11 (13.9)    |
| 5500—<7000                    | 0 (0)      | 2 (8.7)   | 2 (11.1)                  | 4 (5.1)      |
| ≥7000                         | 1 (2.6)    | 0 (0)     | 1 (5.6)                   | 2 (2.5)      |

**Notes:** Values are presented as mean (SD) except for Gender and Serum ferritin level. AA, aplastic anemia; HB, hemoglobin; KPS, Karnofsky Performance Scale; MDS, myelodysplastic syndrome; SD, standard deviation.

*Other rare anemias include thalassemia (n = 6), macrocytic anemia (n = 2), myelofibrosis (n = 2), R/O MDS (n = 2), soft tissue sarcoma (n = 1), pernicious anemia (n = 1), thrombocytopenia (n = 1), paroxysmal nocturnal hemoglobinuria (n = 1), hemolytic anemia (n = 1) and erythroid hypoplasia (n = 1).
discontinued deferasirox during the study period (Figure 1), but drug-related AEs only accounted for 8 (14.3%) of them. The demographics and baseline characteristics of patients are presented in Table 1. Overall, the mean age was 64.3 ± 17.8 years (range, 18–91 years), and 47 (59.5%) patients were male. At baseline, the mean Karnofsky Performance Scale (KPS) score was 81.1 ± 11.0% among all subjects. The mean duration from the diagnosis of anemia to enrollment was 3.2 ± 4.6 years, and the mean number of transfusions in the year prior to study entry was 14.5 (Table 1).

Deferasirox exposure

The majority (93.7%) of patients started the deferasirox therapy (dispersible tablet formulation) at a dose of ≥10 mg/kg/day (10–20 mg/kg/day in 50.6% of patients and ≥20 mg/kg/day in 43.0% of patients). The average starting dose was 18.5 ± 4.67 mg/kg/day (range: 2.19–29.5 mg/kg/day) and the mean dosage received during the study observation period was 17.7 ± 4.02 mg/kg/day (range: 8.3–27.8 mg/kg/day) (Supplementary Table S1). Overall, the mean exposure dose was <20 mg/kg/day in 57 (72.1%) patients and ≥20 mg/kg/day in 22 (27.9%) patients.

Safety

A total of 1230 AEs and 164 SAEs were reported, and all patients experienced at least one AE during the 3-year observational period. Drug adjustments due to AEs were observed in 31 (39.2%) patients and 29 (36.7%) patients permanently discontinued the drug (Table 2). Overall, a majority (85.2%) of AEs were mild (713 events, 58.0%) or moderate (335 events, 27.2%), while severe events, life-threatening events and deaths were reported in 10.7%, 0.8%, and 3.3% of total AE events, respectively. A total of 23 deaths were reported, of which one, death due to heart failure, was considered to be related to study treatment by investigator’s judgement. The most common causes of death were septic shock, heart failure and acute respiratory failure. Of the 1230 AEs, 25 events were hematological and 1205 events were non-hematological (Table 2 and Supplementary Tables S2 and S3). The AEs categorized by diagnosis are presented in Supplementary Table S4. All drug-related AEs were non-hematological and were reported in 48 (60.8%) patients, with skin rash (20.3%), diarrhea (13.9%) and hypercreatinemia (10.1%) being the most common AEs. The most frequent AEs by system organ class were skin and subcutaneous tissue disorders (32.9%), gastrointestinal disorders (30.4%) and investigations (15.2%) (Supplementary Table S3). The most frequent drug-related non-hematological AEs by diagnosis are listed in Supplementary Table S5.

Table 2. Incidence of adverse events by system organ class in overall patient population.

| Event | Patients, n (%) |
|-------|----------------|
| AE    | 1230 (100.0)   |
| Leading to drug adjustment | 62 (31.9) |
| Leading to drug permanently discontinued | 41 (29.6) |
| SAE   | 164 (69.6) |
| Leading to drug adjustment | 20 (12.6) |
| Leading to drug permanently discontinued | 20 (25.3) |

Hematological AEs

- Blood and lymphatic system disorders: 25 (19.0)
- Non-Hematological AEs
  - Gastrointestinal disorders: 262 (78.5)
  - Infections and infestations: 198 (72.1)
  - General disorders and administration site conditions: 119 (64.6)

Non-Hematological AEs

- Respiratory, thoracic and mediastinal disorders: 117 (44.5)
- Skin and subcutaneous tissue disorders: 89 (53.2)
- Nervous system disorders: 72 (49.4)
- Musculoskeletal and connective tissue disorders: 68 (43.0)
- Metabolism and nutrition disorders: 55 (34.2)
- Renal and urinary disorders: 39 (23.9)
- Cardiac disorders: 26 (18.2)
- Psychiatric disorders: 23 (16.0)
- Eye disorders: 22 (14.7)
- Ear and labyrinth disorders: 13 (13.9)
- Hepatobiliary disorders: 13 (12.7)
- Vascular disorders: 13 (13.9)
- Injury, poisoning and procedural complications: 11 (12.7)

- Reproductive system and breast disorders: 15 (11.4)
- Neoplasms: 7 (7.6)
- Immune system disorders: 3 (3.8)
- Endocrine disorders: 2 (2.2)
- Surgical and medical procedures: 2 (2.2)
- Congenital, familial and genetic disorders: 2 (2.2)

*Investigations include: alanine aminotransferase increased, aspartate aminotransferase increased, blood pressure systolic increased, gynecological examination, hepatic function abnormal, hypercreatinemia, hyperproteinemia, occult blood, weight decreased.

Table 3. Incidence of drug-related adverse events (> 5%) by grade in overall patient population.

| Variable/status | All grades (N = 79) | Grades 3–4 (N = 79) |
|----------------|---------------------|---------------------|
| Event N | Patients n (% | Event N | Patients n (%) |
| Overall | 135 | 48 (60.8) | 5 | 4 (5.1) |
| By symptoms | | | | |
| Rash | 17 | 16 (20.3) | 2 | 2 (2.5) |
| Diarrhea | 15 | 11 (13.9) | 0 | 0 (0.0) |
| Hypercreatinemia | 11 | 8 (10.1) | 0 | 0 (0.0) |
| Pruritus | 8 | 7 (8.9) | 0 | 0 (0.0) |
| Abdominal pain | 9 | 6 (7.6) | 0 | 0 (0.0) |
| Constipation | 6 | 6 (7.6) | 0 | 0 (0.0) |
| Eczema | 4 | 4 (5.1) | 0 | 0 (0.0) |
| Abnormal hepatic function | 1 | 1 (1.3) | 1 | 1 (1.3) |
| Hyperbilirubinemia | 1 | 1 (1.3) | 1 | 1 (1.3) |
| Renal failure, acute | 1 | 1 (1.3) | 1 | 1 (1.3) |
| By organ class | | | | |
| Skin and subcutaneous tissue disorders | 36 | 26 (32.9) | 2 | 2 (2.5) |
| Gastrointestinal disorders | 50 | 24 (30.4) | 0 | 0 (0.0) |

*Investigations include: alanine aminotransferase increased, aspartate aminotransferase increased, blood pressure systolic increased, gynecological examination, hepatic function abnormal, hypercreatinemia, hyperproteinemia, occult blood, weight decreased.
Grade 3–4 drug-related AEs were rare, with five events reported in four (5.1%) patients, including skin rash (two events) and abnormal clinical investigations (three events: abnormal hepatic function, hyperbilirubinemia and acute renal failure) (Table 3). The Grade 3 skin rash caused a temporary drug discontinuation in the two patients. Resuming treatment with a lower dose and subsequent dose adjustments led to disease improvement requiring no ICT in these patients.

**Serum ferritin level**

The mean serum ferritin level at baseline was 3000 ± 2120 ng/mL, with a majority of patients (75.95%) having serum ferritin levels between 1000 and 4000 ng/mL. Overall, a statistically significant decrease in serum ferritin levels was observed starting from 2 months of deferasirox initiation (Figure 2). Among patients with MDS and AA, significant reductions in serum ferritin were observed from 5 months of deferasirox initiation, while no significant reductions were observed among patients with other rare anemia. Overall, deferasirox effectively decreased serum ferritin levels from baseline at both 1 year (mean ± SD: 985 ± 2090 ng/mL; P = 0.015) and 3 years (mean ± SD: 2290 ng/mL; P = 0.042).

**Hematological responses**

Hematological responses were assessed according to the IWG 2006 criteria. In the overall patient population and in the MDS subgroup, the erythroid responses were observed in 32.9% (25/76) and 30.6% (11/36) of patients, respectively; platelet responses were observed in 16.7% (7/42) and 11.1% (2/18) of patients, respectively (Table 4). In subgroup analysis, although not statistically significant, the hematological response rates were higher in patients receiving a higher mean deferasirox dosage (10–<20 mg/kg/day) compared with those receiving a lower mean dosage (<10 mg/kg/day; Table 5).

**Long-term overall survival**

The median follow-up time of all patients was 31.4 months, with a maximum of 51.3 months. During this observational period, 36 (45.6%) patients died, with a median time of 11.4 months from study enrollment to death. The survival status was comparable among patients in three disease groups (Figure 3) during the 3 years of observation; however, the median follow-up time was lowest in patients with other rare anemias (15.3 months in MDS, 11.7 months in AA, and 4.4 months in other rare anemia). Mortality was similar in patients receiving a deferasirox dosage ≥20 mg/kg/day vs. <20 mg/kg/day (50.00% vs. 43.86%), and the median overall survival was comparable across the three disease groups.

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**Table 4. Hematological responses in overall patient population and MDS subgroup.**

| Status          | Total n (%) | MDS n (%) |
|-----------------|-------------|-----------|
| Erythroid response | 25 (32.9) | 11 (30.6) |
| Platelet response    | 7 (16.7)    | 2 (11.1)  |

Notes: Inclusion criteria for erythroid response analysis: Pre-treatment Hb levels <11 g/dL (Total N = 76, MDS N = 36). Inclusion criteria for platelet response analysis: Pre-treatment platelet counts <100 × 10^9/L (Total N = 42, MDS N = 18). Erythroid response definition: Hb response (Hb increase ≥ 1.5 g/dL) or Transfusion response (reduction of ≥4 RBC transfusions given only for a Hb of ≤ 9.0 g/dL). Platelet response definition: Increase ≥30 × 10^9/L for patients with > 20 × 10^9/L platelets or increase from <20 × 10^9/L to ≥20 × 10^9/L and by ≥100%. Hb, hemoglobin; MDS, myelodysplastic syndrome; RBC, red blood cell.
survival was not statistically different among the expired patients (5.4 vs. 15.1 months, \( P = 0.5503 \)) (Supplementary Figure S1).

**Discussion**

This study presents the first real-world data in Taiwan for ICT with deferasirox in patients with MDS, AA and other rare anemia. Of the 79 patients, 23 (29.1%) completed the study. Among the remaining 56 patients, the primary reason for study discontinuation was death (24, [42.9%]), while other reasons included AEs (8 [14.3%]), immediate stem cell transplantation required (2 [3.6%]), and disease progression to acute leukemia (1 [1.8%]). High discontinuation rates of deferasirox have also been reported in the previous studies such as EPIC [20] that could be attributed to similar reasons. However, we observed a relatively lower rate of discontinuation due to AEs in this study.

During the 3-year observational period, reported AEs were mostly mild (58.0%) or moderate (27.2%) in severity, and only two grade three skin rash events in two patients with MDS resulted in temporary drug discontinuation. Resuming deferasirox with a lower dose and subsequent dose increments led to disease improvement and therefore permanent drug discontinuation was avoided in these patients. The incidence of skin rash with deferasirox among patients with MDS was higher in our study (23.7%) compared with the EPIC study (6.7%), which enrolled mainly Caucasian patients, while the incidence was lower for abdominal pain (5.3% vs. 7.6%) and diarrhea (13.2% vs. 32.6%). Similarly, the higher incidence of skin rash with deferasirox was also observed in a previous study in Taiwanese patients with \( \beta \)-thalassemia [19]. Different AE profile of deferasirox between Taiwanese and Caucasian patients was therefore speculated. Overall death percentage was 29.1%, which seemed higher compared to earlier reports, however, smaller size of the patient population, patients with more comorbidities and longer observation period might have affected this.

| Variable | Disease | Mean exposure dosage | \( P \)-value$^b$ |
|----------|---------|----------------------|------------------|
| Erythroid Response, n (%) | MDS (N = 36) | AA (N = 22) | Other rare anemia$^a$ (N = 18) | <10 mg/kg/day (N = 55) | 10–<20 mg/kg/day (N = 21) |
| Responders | 11 (30.6) | 7 (31.8) | 7 (38.9) | 17 (30.9) | 8 (38.1) |
| Non-responders | 25 (69.4) | 15 (68.2) | 11 (61.1) | 38 (69.1) | 13 (61.9) |
| Platelet Response, n (%) | MDS (N = 18) | AA (N = 17) | Other rare anemia$^a$ (N = 7) | <10 mg/kg/day (N = 33) | 10–<20 mg/kg/day (N = 9) |
| Responders | 2 (11.1) | 2 (11.8) | 3 (42.9) | 4 (12.1) | 3 (33.3) |
| Non-responders | 16 (88.9) | 15 (88.2) | 4 (57.1) | 29 (87.9) | 6 (66.7) |

Note: AA, aplastic anemia; MDS, myelodysplastic syndrome.

$^a$Other rare anemias include thalassemia (n = 6), macrocytic anemia (n = 2), myelofibrosis (n = 2), R/O MDS (n = 2), soft tissue sarcoma (n = 1), pernicious anemia (n = 1), thrombocytopenia (n = 1), paroxysmal nocturnal haemoglobinuria (n = 1), hemolytic anemia (n = 1) and erythroid hypoplasia (n = 1).

$^b$Chi-square tests or Fisher’s exact test was performed to examine the difference between groups.

**Figure 3.** Overall survival curve during 3-year observational period by diagnosis. Note: AA, aplastic anemia; MDS, myelodysplastic syndrome.
Serum ferritin levels decreased significantly over 3 years in the overall patient population, starting at 2 months after deferasirox initiation. The proportion of patients with a reduction in serum ferritin levels and achieving serum ferritin levels <1000 ng/mL increased over time (data not shown). These observations reflect the reduction in iron burden with deferasirox therapy and the decreased requirement of ICT. In addition, improvements in hematologic parameters in this study suggest the benefit of ICT. Deferasirox treatment in our Taiwanese patients with MDS over this 3-year study provided a higher erythroid response rate compared with the 1-year EPIC study (30.6% vs. 21.5%) [21] (Figure 4).

The effect of deferasirox chelation therapy on disease progression could not be assessed clearly in this study because of its short observation period, and only one disease progression to acute leukemia was noticed. The median survival time was not reached; approximately 50% patients experienced mortality, with a median time to death of 11.4 months. The survival status and median time to death were similar among patients with different disease types and between dose cohorts.

In conclusion, this first 3-year real-world study conducted in Taiwan was aimed to evaluate the long-term safety and efficacy of deferasirox in patients with MDS, AA, and other rare anemias requiring chronic transfusion. The AEs reported were mostly mild (57.97%) or moderate (27.24%) in severity. The incidence of skin rash was considerably higher among Taiwanese patients in our study compared with EPIC study, which enrolled mainly Caucasians; while the incidence of abdominal pain and diarrhea was relatively lower. Significant decrease in serum ferritin levels suggested a decreased demand of iron chelation therapy and the alleviation of iron overload after deferasirox treatment. Compared with EPIC study, this study on Taiwanese patients showed a higher erythroid response rate with deferasirox in patients with MDS (21.5% vs. 30.6%). However, further studies with a larger study population may be required to further confirm the observations in this non-interventional study.

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Figure 4. Comparison of hematological response in patients with MDS between Taiwan and EPIC study.
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